CONTENTS

NASA Technical Paper 1087

Induced Velocity Field of a Jet in a Crossflow

Richard L. Fearn and Robert P. Weston

MAY 1978

NASA

Item 830-H-15. NAS1.60:1087

NASA Technical Paper 1087

Induced Velocity Field of a Jet in a Crossflow

Richard L. Fearn
University of Florida
Gainesville, Florida

and

Robert P. Weston
Langley Research Center
Hampton, Virginia

NASA
National Aeronautics and Space Administration

Scientific and Technical Information Office

1978

SUMMARY

An experimental investigation of a subsonic round jet exhausting perpendicularly from a flat plate into a subsonic crosswind of the same temperature has been conducted in the Langley V/STOL tunnel. Velocity and pressure measurements were made in planes perpendicular to the path of the jet for ratios of jet velocity to crossflow velocity ranging from 3 to 10. The results of these measurements are presented in tabular and graphical forms. A pair of diffuse contrarotating vortices is identified as a significant feature of the flow, and the characteristics of the vortices are discussed.

INTRODUCTION

During the transition between hover and wing-borne flight, a significant part of the lift of a VTOL aircraft is furnished by direct engine thrust. This injection of a high velocity jet of air at almost right angles to the crossflow caused by the forward motion of the aircraft produces a complicated flow field which affects the aerodynamic characteristics of the aircraft. Several wind-tunnel tests have been conducted to measure these jet-induced effects on the pressure loading and aerodynamic coefficients for specific aircraft configurations. (See refs. 1 to 9.)

Traditionally, investigators have attempted to study this complicated flow field by concentrating on a simplified model in which a subsonic round jet exhausts perpendicularly through a large flat plate into a subsonic crossflow. These studies have application to areas other than V/STOL aerodynamics such as the process of cooling combustion gases in gas-turbine combustors or the discharge of an effluent into a waterway. For several decades experiments have been conducted on certain aspects of this jet in a crossflow problem, namely, the path of the jet (refs. 10 to 17) and the pressure distribution on the flat plate (refs. 15 and 18 to 25). However, the pair of contrarotating vortices, which constitutes one of the dominant features of the velocity field, has only recently received detailed attention (refs. 15, 16, 17, 26, and 27). An extensive bibliography for work done prior to 1969 is given in reference 28.

One motivation for studying a jet in a crossflow is to develop an analytical description of the pressure distribution on the flat plate through which the jet exhausts. It is this aspect of the problem which has direct application to the design of VTOL aircraft. The aerodynamic characteristics of VTOL aircraft could be predicted by incorporating a mathematical model for calculating the pressure distribution on the flat plate into a lifting-surface computer program. Attempts to formulate such models have been hampered by an inadequate description of the flow field for a jet in a crossflow (ref. 29). Only the trajectory of the jet has been conveniently available to those attempting to formulate such models. The models have usually consisted of placing potential flow singularities along the jet center line to model mass entrainment and the vortex pair.

The strengths of these singularities are varied to obtain a best fit to experimentally determined pressure distributions (ref. 30). A description of the physical properties of the vortex pair associated with a jet in a crossflow would represent a significant increase in the information available for the construction of models for calculating the pressure distribution on the flat plate.

In order to avoid wind-tunnel wall effects, most previous experiments have been restricted to jets with rather small diameters of 0.6 to 2.5 cm (0.25 to 1.0 in.). For the present study the large test section of the Langley V/STOL tunnel permitted the use of a relatively large 10.16-cm-diameter (4.0-in.) air jet. The test-section size expressed in jet diameters is comparable with those used by other investigators and wall effects should be negligible over the experimental range of ratios of jet velocity to crossflow velocity (designated "velocity ratio" herein).

The primary purpose of the present study is to provide extensive data suitable for the quantitative description of the flow field associated with a jet in a crossflow. The flow-field properties most clearly display symmetry and other simplifying features when they are studied in jet cross sections. Consequently, most of the velocity and pressure measurements of the present study were made in this manner. Measurements of the three components of velocity and the total and static pressures in the flow field are presented in tabular form. These tables present measurements in numerous cross sections for velocity ratios of 3, 4, 5, 6, 7, 8, and 10 and from 2 to 45 jet diameters downstream of the jet orifice. Measured velocities are used to determine the jet center line and vortex curves over the experimental range of velocity ratios. Selected cross-section measurements of velocity and pressure are displayed in graphical form and the noteworthy features they exhibit are discussed.

The velocity measurements presented in this report have been utilized in two models which infer the properties of the pair of contrarotating vortices from selected velocity measurements and the results have been reported (ref. 27). One model represents the vortices as filaments and yields a measure of lateral spread and strength; the other model additionally accounts for the diffuseness of the vortices. Reference 17 represents the first attempt to provide a quantitative description of the flow-field vorticity for a wide range of velocity ratios.

Three appendixes to the present report are presented. Appendix A by Thomas Trovillion of the University of Florida, Gainesville, Florida, describes the calibration scheme developed for the rake of seven yaw-pitch probes used in the present study for velocity measurements. Appendix B discusses the inaccuracies involved in positioning the rake of probes. Tables of the experimentally determined velocities and pressures for all conditions studied are presented in appendix C.

SYMBOLS

Values are given both in SI Units and U.S. Customary Units. The measurements and calculations were made in U.S. Customary Units.

A area of jet orifice, m^2 (ft^2)

A_j jet exit area corrected for nozzle boundary-layer thickness, m^2 (ft^2)

a,b,c curve fitting parameters

C_p static-pressure coefficient, $(p - p_\infty)/q_\infty$

$C_{p,t}$ total-pressure coefficient, $(p_t - p_{t,\infty})/q_\infty$

D jet diameter, cm (in.)

M Mach number

p static pressure, Pa (lb/ft^2)

p_t total pressure, Pa (lb/ft^2)

q dynamic pressure, Pa (lb/ft^2)

R effective velocity ratio defined by equation (1)

s arc distance along a jet path, m (ft)

U,V,W X, Y, and Z components of velocity; denotes components in wind-tunnel system when no subscript is used, m/sec (ft/sec)

$U_{℄}$ jet center-line speed, m/sec (ft/sec)

U_j speed of jet fluid at jet orifice, m/sec (ft/sec)

X,Y,Z Cartesian coordinate system denotes wind-tunnel coordinate system when no subscript is used (see fig. 1)

x,y,z distances along X, Y, and Z axes, m (ft)

Γ strength of each vortex, m^2/sec (ft^2/sec)

θ_s angle of inclination of rake sting with respect to adapter sting as shown in figure 4, deg

ρ mass density, kg/m^3 ($slugs/ft^3$)

φ_B angle between Z axis and probe, deg

φ_c angle between Z and Z_c axes (see fig. 2), deg

φ_v angle between Z and Z_v axes (see fig. 2), deg

ω vorticity, sec^{-1}

ω_{max} maximum vorticity of each diffuse vortex, sec^{-1}

Subscripts:

B refers to probe

c refers to jet center line

j refers to condition at jet orifice

v refers to vortex curve

∞ refers to crossflow condition

An arrow over a symbol denotes a vector.

PATH OF THE JET

Flow visualization is the most convenient method for determining the path of a jet in a crossflow. The jet can be seeded with smoke or water vapor, and the result photographed for a range of velocity ratios. The stippled area shown in figure 1 represents the observed smoke plume for a velocity ratio in the range of 7 to 8 (ref. 14). Note that fitting a curve through such a broad plume of smoke presents some problems in judgment.

A more reliable method of describing the path of the jet is to follow the maximum of the axial component of the jet velocity as the jet is deflected by the crossflow. Called the jet center line, this curve has been defined (ref. 12) as the locus of points of maximum velocity in the plane of symmetry of the flow (XZ plane, fig. 1). By use of this definition, it is possible to obtain a well-defined curve from the jet orifice to the region where the local axial component of the jet velocity has decayed to such a degree that it is experimentally difficult to locate a maximum. This usually occurs around 15 jet diameters downstream of the jet orifice.

Another method of describing the jet path is based on the vortex pair associated with a jet in a crossflow. Such a description, called the vortex curve, may be defined as the projection of the center of either vortex onto the symmetry plane. The location of the vortex curve relative to the jet center line and smoke plume is shown in figure 1. In the region between the two vortices there is constructive interference of the induced velocities that produces an "upwash" velocity component in the plane of the cross section. This "upwash" velocity has a maximum in the symmetry plane along the line joining the two vortex centers and can be used to locate the vortex curve experimentally. The vortex curve is as easily determined experimentally as the jet center line. Since the vortices have been found to be the most persistent feature of the flow, the vor-

tex curve can be determined much farther downstream of the jet orifice than the jet center line. In fact, the definition of the jet center line must be used with care because in some cross-sections the velocity induced by the vortex pair can be comparable with or greater than the local jet center-line speed.

The jet center line and vortex curve are two well-defined curves to describe the path of a jet in a crossflow. Both descriptions are useful and both will be utilized in this report. A plane perpendicular to the jet center line will be called a jet center-line cross section, likewise, for a vortex curve cross section. Figure 2 is a sketch of the two curves and their associated coordinate systems. In general discussion, when it is not desirable to refer to either of these descriptions specifically, the terms jet path and jet cross section will be used.

APPARATUS

This experiment was conducted in the Langley V/STOL wind tunnel which is a closed return atmospheric tunnel with a test section 4.42 m by 6.63 m (14.50 ft by 21.75 ft). Test-section airspeeds for this investigation ranged from 15 m/sec to 62 m/sec (49 ft/sec to 203 ft/sec), or free-stream Mach numbers of 0.04 to 0.18. Jet Mach numbers ranged from 0.32 to 0.93.

The flat plate was originally constructed from a 1.22-m by 2.44-m (4-ft by 8-ft) sheet of 1.91-cm (0.75-in.) plywood with an overlay of 1.59-mm-thick (0.0625-in.) formica on the upper surface. (1.22-m by 2.44-m measurements correspond to 12D by 24D.) A hole for the nozzle was centered midway between the long sides of the plate and 6D aft of its leading edge. Sheet metal fairing was used on the underside of the flat plate to protect the pressure leads and to streamline the jet nozzle-plenum assembly.

The measured velocities presented in this report are the results of two tunnel tests. For the first test, the flat plate was mounted 3D above the tunnel floor. During the second test, a full-span 3D leading-edge extension was added to the flat plate and the plate was mounted 4.5D above the tunnel floor. The purpose of these changes in geometry was to reduce a slight static-pressure gradient which occurred in the vicinity of certain static-pressure ports on the flat plate (ref. 25). The geometry changes had a negligible effect on the velocity field.

The jet of air was formed by using a plenum chamber and a 20:1 convergent nozzle designed to provide a flat velocity profile at the 10.16-cm-diameter (4.00-in.) nozzle exit (ref. 31). In order to measure the static pressure in the jet as close to the plane of the plate as possible, a small ring was installed at the jet orifice with four static-pressure ports spaced equally around the inside surface of this jet exit ring 0.64 cm (0.25 in.) from the exit plane. When the plate was mounted 4.5D above the tunnel floor, a constant-diameter cylindrical extension was used to extend from the convergent nozzle to the jet exit ring. Figure 3 is a sketch of the nozzle-plenum assembly with the extension in place. Supply air for the jet was heated so that the temperature at the jet orifice would be approximately the same as that of the crossflow. A

venturi flowmeter in the air supply line was used to measure the mass flow rate of the jet.

Velocity measurements were made with a rake of seven parallel yaw-pitch probes mounted 5.08 cm (2.00 in.) apart on the leading edge of an airfoil as shown in figure 4. This figure also shows the rake of probes mounted on a 2.54-cm-diameter (1.00-in.) rake sting which could be pivoted and secured at 5° increments with respect to a 5.08-cm-diameter (2.00-in.) adapter sting. Each probe was 20.32 cm (8.00 in.) long and 0.64 cm (0.25 in.) in diameter. Five pressure orifices were located on the hemispherical tip of each probe, and a ring of six interconnected static-pressure ports were located 5.08 cm (2.00 in.) aft of the probe tip. (See fig. 5.) A photograph of the apparatus installed in the wind tunnel is shown in figure 6. A remotely driven lead screw was installed in the 15.2-cm-diameter (6.0-in.) wind-tunnel sting to provide about 41 cm (16 in.) of longitudinal movement for the adapter sting rake with respect to the wind-tunnel sting. In figure 6, the adapter sting is in the fully retracted position.

Two boundary-layer survey devices were used to measure the boundary layer on the flat plate. One was comprised of a static-pressure probe and a bank of 6 total-pressure probes spanning 0.4 cm (0.16 in.); the other had 19 total-pressure probes and spanned 4.2 cm (1.65 in.).

All pressures were measured with pressure transducers which were calibrated with water or mercury manometers. The leads from the pressure ports on the probes were connected by plastic tubing to a pressure scanning device mounted inside the wind-tunnel sting. Each device consisted of a single pressure transducer which could be connected sequentially to each of 48 pressure tubes. The output of each pressure transducer was fed into a low pass filter to attenuate fluctuations in the transducer output signal. One second after each static-pressure port was connected to the pressure transducer, the signal from the filter was sampled and recorded on magnetic tape.

TEST PROCEDURES AND CONDITIONS

Jet Nozzle Characteristics

The characteristics of the jet nozzle exhausting into still air were investigated prior to the wind-tunnel experiment. Velocity determinations were made in the exit plane of the jet by separate surveys with a pitot tube and with a static-pressure probe. Velocity distributions were also determined at several jet cross sections downstream of the exit plane by surveys with a pitot-static probe. These studies were made at jet Mach numbers of 0.3, 0.5, 0.8, and 1.0.

P. Saha (ref. 32) has compared the measured velocity distribution for the jet nozzles used in the present experiment with the results of Albertson, Dai, Jensen, and Rouse for a free jet (ref. 33). Reference 33 presents a descriptive model for the free jet based on an assumed Gaussian distribution for the axial velocity component. The experimentally determined parameter in their model is evaluated from the measured jet center-line decay. Figure 7 compares the jet center-line decay of the nozzle used in the present experiment with the results

of reference 33. The present results for $M_j = 0.3$ coincide with those of reference 33, where jet Mach numbers were less than 0.2. There is a noticeable variation in the center-line decay characteristics with jet Mach number. The length of the jet core increases, and the center-line speed decays less rapidly, with increasing Mach number.

Outside of the nozzle boundary layer, the exit plane velocity profile was flat to within 0.5 percent of the velocity measured at the center of the jet. The boundary-layer displacement thickness of the nozzle at the exit plane (without nozzle extensions) was determined experimentally to be $(2.8 \pm 0.5) \times 10^{-3}$ D. There was no noticeable variation of the boundary-layer profile with jet Mach number.

Effective Velocity Ratio

Early investigators (refs. 12 and 13) expressed the properties of a jet in a crossflow in terms of the ratio of jet velocity to crossflow velocity. This is appropriate under certain simplifying conditions; however, in general, it is the ratio of the momentum flux across the jet orifice to the momentum flux of the crossflow over an equal area that is the significant dimensionless parameter. In order to be consistent with the terminology of the early investigations, it is convenient to define an effective velocity ratio as the square root of this ratio of momentum fluxes

$$R = \left(\frac{\int_A \rho_j U_j^2 \, dA}{\rho_\infty U_\infty^2 A_j} \right)^{1/2} \tag{1}$$

If the density of the two fluids is the same and if U_j is constant over the jet orifice, then equation (1) reduces to the ratio of jet velocity to crossflow velocity. It should be noted that the reciprocal of equation (1) is used by some investigators and is usually referred to by the same name.

Other useful equations for the effective velocity ratio can be obtained from equation (1). Some of these variations and their application to the present investigation are discussed in reference 25. For presentation of results in this report, the appropriate simplification of equation (1) is $R = M_j/M_\infty$. This relationship results from the assumption of a jet with flat velocity profile expanding isentropically from plenum total pressure to the crossflow static pressure. It also provides consistent comparison with data from the other investigators who calculate their velocity ratios in a similar way.

Calibration of Yaw-Pitch Probes

Large angles (over 45°) were encountered between individual probes and the direction of local airflow when the rake of probes was positioned in planes perpendicular to the jet path. A separate wind-tunnel test was conducted to provide calibration data for a large range of flow angularity. Figure 8 is a photograph of the rake of probes and sting arrangement for the calibration test. The U-shaped sting allowed the probes to remain in the same tunnel location as

the vertical sting was rotated about its axis to provide a range of tunnel yaw angles. The roll position of the rake could be changed manually by rotating the rake airfoil with respect to the rake sting. This rotation enabled the tunnel yaw degree of freedom to be used for both yaw and pitch sweeps of the rake. Data for flow angles in the range of -65° to +65° in both yaw and pitch were taken. Additionally, selected measurements were taken over a tunnel yaw range for intermediate roll positions of the rake. This was done to check the calibration scheme developed from the rake yaw and pitch data. Most of the measurements were made at a tunnel airspeed of 40 m/sec (131 ft/sec) but selected measurements were repeated at an airspeed of 68 m/sec (223 ft/sec) to verify that the calibration did not depend on tunnel airspeed.

A calibration scheme based on potential-flow theory is presented in appendix A. In this scheme, the potential-flow solution for uniform flow over a sphere is generalized to provide equations relating the pressure distribution on the hemispherical tip of each probe to the flow velocity. The undetermined parameters in these equations are evaluated from the calibration data. Based on the results of the calibration experiment, it is estimated that errors in determining flow angularity are usually less than a degree or two, errors in determining airspeed rarely exceed 5 percent, and errors in determining static and total pressure are usually less than 10 percent. These error estimates are for uniform flow with flow angularity within the range of the calibration experiment. They do not include the effects of high turbulent intensity such as are encountered throughout the jet plume or of large velocity gradients such as are encountered near the jet orifice. No estimates of the errors due to these effects have been made. However, in an attempt to reduce the errors due to large pressure gradients in the flow, only pressure measurements from the probe tip have been used in this calibration scheme.

Data Acquisition in Jet Cross Sections

Flow-field measurements for a jet in a crossflow most clearly display identifiable characteristics and other simplifying features when they are made in cross-section planes through the jet plume. For this reason, most of the velocity and pressure measurements of the present study were made in this manner. Table 1 summarizes the extent of the flow-field measurements of the present study and for three other experiments in tunnels of various sizes. All have emphasized data acquisition in jet cross sections for a range of velocity ratios and represent a range of jet diameters from 0.64 to 10.16 cm.

The decision to measure velocities in planes perpendicular to the jet path placed stringent requirements on the location and orientation of the rake of probes. These requirements had to be reconciled with the realities of the experimental arrangement in such a way that the test could be performed in a reasonable length of time. The types of motion available through the tunnel sting system had to be augmented by equipment designed specifically for this experiment. The problem of positioning the rake of probes and the errors in probe placement due to compromises made to utilize available equipment are presented in appendix B. Based on the results of this analysis, it is estimated that the inaccuracy in probe placement in any direction rarely exceeded 0.1D.

EXPERIMENTAL RESULTS

Scope of Present Investigation

The data presented in this report were taken during two wind-tunnel tests. The primary purpose of the first test was to acquire enough velocity measurements in each of a few jet cross sections to describe the local properties of the pair of contrarotating vortices associated with a jet in a crossflow for effective velocity ratios of 4 and 8. These measurements represented one of the first attempts to describe these vortices quantitatively. Velocity measurements were taken at approximately 1350 locations in eight jet cross sections. The vortices were found to be much more diffuse than aircraft wing-tip vortices, and only the four largest cross sections of this test were extensive enough to include the entire region of significant vorticity. The results of this test made clear the magnitude of the task of providing a straightforward numerical description of the vortex pair as it develops from one cross section to another and for a range of effective velocity ratios. Also included in the first test were velocity measurements in several vertical sections in the jet-wake region.

After conducting the first experiment, it was apparent that further progress depended on the development of a scheme for inferring the vortex properties from a relatively small sample of velocity measurements. Two models were developed to accomplish this: one assumed that the contrarotating vortices behave like vortex filaments, and the other, that they behave like diffuse vortices with a specific distribution of vorticity (ref. 27). The location, strength, and diffuseness (for the diffuse vortex model) of the vortices were to be determined at a cross section by selected velocity measurements in that cross section. The vortex filament model required only a few velocity measurements in the plane of flow symmetry; whereas the diffuse vortex model required additional velocity measurements out of the symmetry plane.

The primary purpose of the second test was to acquire sufficient velocity measurements to infer the properties of the vortex pair at several cross sections for each of a series of effective velocity ratios. In this second test, a distinction was made between data acquired to determine the location and decay of the jet center line and data acquired to infer the properties of the vortex pair. Results of the first test and the work of Thompson (ref. 15) were used to estimate the location of the vortex curve. During the second test, velocity measurements were made at approximately 1150 locations in 26 cross sections for use in the diffuse vortex model. The velocity was also measured in the symmetry plane in an additional 61 cross sections for use in the vortex filament model. These velocity measurements were made for effective velocity ratios of 3, 4, 5, 6, 7, 8, and 10. Additional velocity measurements were made in the symmetry plane to verify the location of the jet center line for each velocity ratio. The extent and conditions for these two tests are presented in table 2.

The measured velocities, static pressures, and total pressures for these two tests are presented in appendix C (tables C1 to C4).

Measurements in Symmetry Plane

Jet center line.- Determination of the jet center line has been one of the primary objectives of many theoretical and experimental studies of a jet in a crossflow. Its determination is included in the present study to supplement the description of the vortex pair associated with the jet and to provide a means of comparison with the results of other experiments.

An experimental determination of the jet center line is straightforward. As the jet is deflected by the crossflow, the velocity in the jet decays rapidly to values comparable with the crossflow velocity. This deflection and decay of the axial component of velocity in the jet can be detected by suitable placement of velocity measuring probes in the plane of flow symmetry (XZ plane). An initial estimate of the jet center line, obtained from the results of other experiments (ref. 14), was used to position the rake of probes for the wind-tunnel experiment. The value and location of the maximum axial component of velocity at each rake location can be determined by fairing a curve through the measured values of U_B/U_∞. The locus of points of these maxima for a given velocity ratio determines the jet center line.

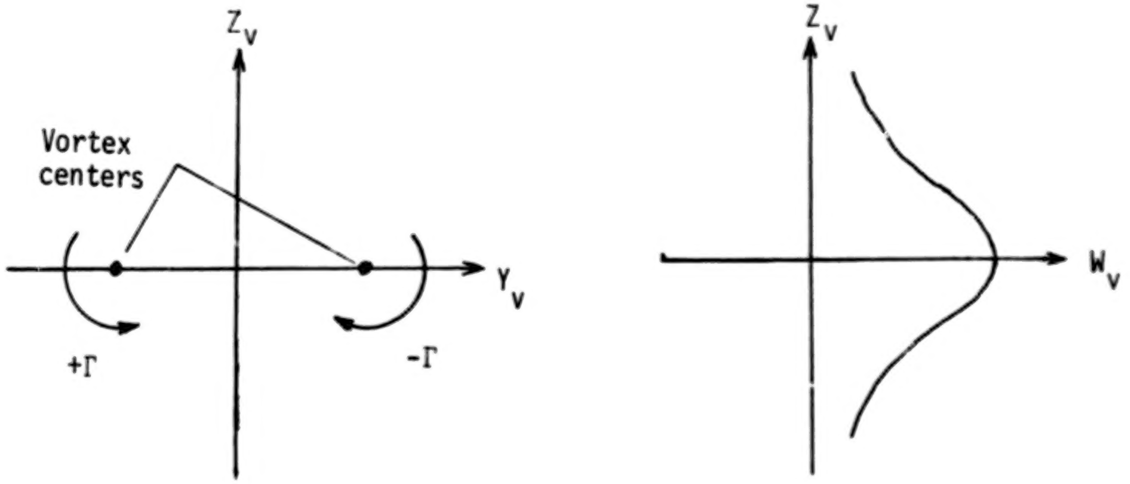
An iterative process was utilized in which this curve serves as a first approximation to the jet center line. The axial components of the measured velocities in cross sections to this curve were used to define a second approximation to the jet center line. Such a process could be continued until negligible changes in the curve resulted. However, because of the nature of the velocity field in the region of the jet center line, the first approximation was found to provide an adequate description of the jet center line.

Table 3 presents the results of the jet center-line study. The location and orientation of the rake, the location of the jet center line, the final cross-section angle, and the maximum axial velocity are presented for each cross section studied. For cross sections sufficiently far from the jet orifice, measurements from all seven probes are used to determine the center-line properties. For cross sections close to the jet orifice ($x/D \lesssim 2$), large velocity gradients are encountered for which the probe spacing is sometimes too great to provide a precise description of the velocity profile in the vicinity of the center line. However, it is thought that the three probes closest to the maximum measured velocity provide an adequate description of the center-line properties. For most of the cross sections, information from four or more probes is used to determine the jet center-line properties.

The jet center-line decay properties are indicated in figure 9. In this figure, the quantity $(U_{\mathfrak{t}} - U_\infty \cos \varphi_c)/(U_j - U_\infty \cos \varphi_c)$ is plotted against arc distance along the jet center-line curve. This curve represents an attempt to display the jet center-line decay in a manner which would be compatible with a coflowing jet in the limit as φ_c approaches zero. Figure 9(a) compares the results of the present study with the results of Kamotani (ref. 17) for an effective velocity ratio of 8. Also shown in figure 9 are the center-line decay properties of the jet when there is no crossflow (free jet). The effect of jet Mach number on the decay properties which is apparent with no crossflow (see fig. 7) is considered to be secondary to the effect of the velocity ratio for a jet in a crossflow. Selected measurements at different jet Mach numbers support this

assumption. Figure 9(b) presents the decay of the jet center-line speed for effective velocity ratios of 3, 6, and 10. The trend of the data shows an increased amount of jet decay as effective velocity ratio decreases. The results for velocity ratios of 3 and 10 serve as an envelope for the decay properties of the intermediate velocity ratios of the present study.

Vortex curve.- The vortex curve partially describes the location of the vortex system associated with a jet in a crossflow. The diffuse contrarotating vortices which form near the jet orifice are carried downstream along trajectories which depend on the velocity ratio. The vortex pair induces a velocity field in the plane of a vortex cross section which is easily detected experimentally (ref. 16). Along the line of intersection of the symmetry plane with a vortex curve cross section (Z_v axis, fig. 2), the W_v velocity distribution induced by the vortices exhibits a maximum at the point of intersection of the vortex curve with the cross section as indicated in sketch (a).



Sketch (a)

This symmetry plane behavior provides a simple experimental means of determining vortex position at a particular rake location. In practice, self-consistent results were achieved with an iterative technique similar to that used to determine the jet center line. To obtain the velocity measurements needed in this approach, an initial estimate of the vortex curve was used to position the rake of probes. The point at which the velocity component along the initial Z_v axis reached a maximum supplied a first approximation to the vortex position. The locus of these points for a given effective velocity ratio defined a new vortex curve. The measured velocities were next projected into a coordinate system defined by the revised vortex curve and this process was continued until there was a negligible change in the location of the vortex curve. The results of the vortex curve determination are shown in table 4. The location and orientation of the rake, the location of the vortex curve, the arc length along the vortex curve, and the final cross-section angle are presented for each condition that resulted in useful information.

Discussion of measurements.- Both the jet center line and the vortex curve can be described adequately by an equation of the form

$$z/D = aR^{b}(x/D)^{c} \tag{2}$$

The parameters a, b, and c can be determined by fitting this equation in a least-squares sense to values for the center-line and vortex-curve locations from tables 3 and 4, respectively. For a given velocity ratio, only location values for a single crossflow velocity were used in determining the parameters. In the tables, the superscript b denotes supplemental data at alternate crossflow velocities and at positions for which the velocity measurements yielded locations of marginal reliability. The parameter values which resulted are $a_c = 0.9751$, $b_c = 0.9085$, $c_c = 0.3385$, $a_v = 0.3515$, $b_v = 1.122$, and $c_v = 0.4293$. The root-mean-square deviations of the points used to determine the parameters from the resulting center line and vortex curves are 0.19D and 0.26D, respectively. The slight differences between parameter values listed for equation (2) and those presented in reference 27 are due primarily to a minor improvement in the probe calibration scheme.

Figure 10 provides a visual indication of the quality of the fit of the equation to the tabular values. The results of the center-line and vortex-curve determinations are presented for effective velocity ratios of 3, 4, 5, 6, 7, 8, and 10. Also included are Margason's curves for the jet center line (ref. 14) which were used as a guide in positioning the rake of probes for the present study. In figure 11, the scales of the ordinates are dimensioned so that the experimentally determined jet center lines or vortex curves for all effective velocity ratios each collapse to a single curve. (See eq. (2).) This figure is used to compare the results of the present study with the results of other experiments. Agreement among the results of Harms (ref. 26), Thompson (ref. 15), Kamotani and Greber (ref. 16), and the present experiment are good. These four experiments represent a range of jet diameters from slightly over 0.5 cm (0.3 in.) to about 10 cm (4 in.) and a variety of test conditions and velocity measuring apparatus.

Some appreciation for the information contained in the symmetry plane data and for the shortcomings of the present study can be inferred from figure 12. Shown in this figure are some of the measured velocities displayed as vectors in the plane of flow symmetry for effective velocity ratios of 4 and 8. The velocity was measured twice at each point; whenever the arrows for the two measurements are resolvable in the figure, they are drawn separately. One of the first things to note from this figure is that in most cases the velocity measurements are repeatable to a reasonable degree. Variations large enough to show up in this figure occur mainly for cross sections in regions of large velocity gradients near the jet orifice. As one approaches the jet orifice, the pressure and velocity gradients become large enough to cause one or more of the following difficulties: (1) the probe spacing becomes too large to define the velocity profile adequately for determining the center-line or vortex-curve location at a cross section; (2) appreciable errors are introduced in the iterative technique used to determine the center line and vortex curve; and (3) errors in the velocity determination itself are introduced because of significant pressure changes over distances comparable with the physical dimensions of the probe head. Some evidence of the first two difficulties is encountered for low velocity ratios at

cross sections near $x/D = 2$. In the region from $x/D \approx 2$ to $x/D \approx 12$, the pressure gradients are not too severe for the apparatus and techniques used in the present study. The properties determining the jet center line and vortex curve are apparent: the axial velocity in the jet is noticeably larger than the crossflow speed, and the change in direction of the velocity vectors is discernible in the vicinity of the vortex curve. In this region, the span of the rake is large enough and the probe spacing small enough to adequately describe the velocity profile determining either curve if the rake is well placed. For the region $x/D > 12$, the axial velocity of the jet in the vicinity of the jet center line has decayed to such a degree that it is difficult to determine the center-line location. Although the change in the direction of the velocity due to the contrarotating vortices is still evident, the span of the rake of probes is not large enough to provide an adequate description of the velocity profile locating the vortex curve. In addition to the broadening of the velocity profile used in determining the vortex curve, the initial placement of the rake of probes was not very accurate because of a lack of prior knowledge about the vortex structure. Although the present study attempted to detect the vortex curve location to $x/D = 45$, the results in this region are sketchy. The difficulties encountered in this region could be corrected by forming larger cross sections by multiple placement of the rake of probes.

Measurements in Jet Cross Sections

The results of velocity measurements in the plane of flow symmetry are useful in determining the jet center-line and vortex curves which serve to locate the jet plume as a function of the effective velocity ratio. A more detailed description of the flow structure of a jet in a crossflow requires additional velocity and pressure measurements out of the plane of flow symmetry. Table C3 presents velocity and pressure measurements for 45 cross sections over a range of velocity ratios from 3 to 10.

The results of extensive measurements in two cross sections for an effective velocity ratio of 4.0 and in three cross sections for an effective velocity ratio of 8.0 are presented in figures 13 to 17. Each figure presents a graphical description of the flow field at a given cross section in four parts: (a) contours of constant total pressure, (b) contours of constant velocity component perpendicular to the cross section superimposed with a vector plot of the projections of measured velocities onto the cross section, (c) contours of constant vorticity, and (d) contours of constant static pressure. This series of figures represents the results of measurements in the five largest cross sections of the present study. These cross sections were obtained by multiple sweeps (in lateral direction) with the rake of seven yaw-pitch probes. Each cross section in figures 13 to 17 is located by specifying the location of one point of measurement in the plane $y = 0$ and the angle of inclination of the cross section. The reference point chosen is the location of the center probe of the rake for the lowest sweep of the cross section. Although most measurements were made in the half-plane $y \geq 0$, some measurements were made for $y < 0$ to verify that $y = 0$ is a plane of mirror symmetry for the flow. Figure 12 provides a visual indication of the locations of these multiple sweep cross sections. Included are cross sections relatively near the jet orifice where gradients are large, and one cross section sufficiently far downstream that the jet

center-line speed has decayed to such a degree that locating the jet center line would be difficult.

Since many of the properties of the jet appear to be functions of arc length along the jet center line or vortex curve, it is convenient to locate each cross section by its intersection with one of these curves. The following table provides this information:

Figure	Effective velocity ratio	Cross-section angle, deg	Reference location		Intersection with center line			Intersection with vortex curve			$U_{℄}/U_\infty$
			x/D	z/D	x/D	z/D	s_c/D	x/D	z/D	s_v/D	
13	4.0	32	4.16	2.03	2.61	4.72	5.7	3.59	2.96	4.9	1.62
14	4.0	15	9.22	3.88	8.41	6.93	12.1	9.07	4.43	10.6	1.16
15	8.0	42	7.60	4.81	3.40	9.74	10.7	5.20	7.60	9.6	1.96
16	8.0	30	10.00	5.31	6.18	11.96	14.2	8.34	9.12	13.1	1.47
17	8.0	20	15.18	11.98	13.76	15.96	22.8	15.20	11.91	20.5	1.11

Each of the physical quantities presented in this series of figures provides a partial description of the structure of a jet in a crossflow. It is useful to discuss the type of information to be gained from each quantity.

The total-pressure coefficient is the easiest flow parameter to measure and the description of the jet developing into a characteristic kidney shape is based on the shape of contours of constant total pressure in the neighborhood of the jet center line. (See refs. 12 and 13.) These contours can serve to locate the jet center line (highest value) and the wake region (negative values). The region unaffected by viscous effects of the jet would be characterized by a constant zero value of the total-pressure coefficient. In this region a potential flow model for the far-field effects of the jet would be applicable.

Measuring the three-dimensional velocity field in a cross section is considerably more difficult than measuring the total pressure. The attempt to display the velocity field for several cross sections represents a major effort of the present investigation. The velocity component perpendicular to a cross section is presented as contours of the dimensionless velocity $U_B/U_{℄}$, where $U_{℄}$ is the jet center-line speed for that cross section. (See table 3.) These contours can be used to determine the jet center-line location, and their shape in the neighborhood of the jet center line also exhibits the characteristic kidney shape attributed to a jet in a crossflow. The component of the free-stream velocity perpendicular to the cross section is represented by the contour $(U_\infty/U_{℄}) \cos \varphi_B$ and can be used to identify the region where the jet has negligible effect on this component of the velocity. Values of this quantity for the large cross sections are

Figure	13	14	15	16	17
$(U_\infty/U_{℄}) \cos \varphi_B$	0.52	0.83	0.38	0.59	0.85

Projections of the velocity onto the cross section for each point of measurement are presented as arrows. The arrow plots show very clearly that the vorticity is a significant feature of the flow; one that is not evident from total-pressure measurements and consequently was overlooked or ignored in many early studies of a jet in a crossflow. The presence of an "upwash" along the line $y = 0$, which serves to locate the intersection of the vortex curve with each cross section, is also apparent.

The role of vorticity in describing the structure of a jet in a crossflow is clarified by calculating the component of vorticity perpendicular to a cross section and displaying this information as contours of constant vorticity. In these figures the vorticity is nondimensionalized by the maximum value encountered in each cross section. In terms of the vorticity contour plots, the region of interest is shifted from the neighborhood of the center line to the region near the vortex curve. The shape of the jet in a crossflow as characterized in this manner is simply a pair of contrarotating vortices which are rather diffuse in nature.

The measurements of static pressure are presented as contours of constant static-pressure coefficient. These contours provide still a different representation of the structure of a jet in a crossflow.

Some specific observations on the structure of a jet in a crossflow can be made from the information presented in figures 13 to 17. The decay and diffusion of the various properties from one cross section to another for a given velocity ratio are apparent. Total pressure, static pressure, and normal velocity component all decay much more rapidly than the vorticity. At the location of the cross section presented in figure 17, there is little effect other than that produced by the pair of diffuse vortices.

With the exception of figure 17, there is a well-defined wake region as evidenced by negative total-pressure coefficients. For both velocity ratios this region extends toward the flat plate as far as measurements were taken. The lateral extent of the wake region appears to be about two jet diameters to either side of the symmetry plane for an effective velocity ratio of 4 and somewhat less for a velocity ratio of 8. The wake regions in figures 13 and 15 are characterized by a small region of retarded flow between the intersections of the center line and vortex curve with the cross section. For figure 13 ($R = 4$), the fluid speed in this region is about one-half the free-stream speed and for figure 15 ($R = 8$), it is approximately equal to the free-stream speed. This could be the remnant of a dead air or backflow region caused by separation of the flow around the jet boundary near the flat plate.

The presence of a pair of contrarotating vortices is evident from the arrow plots and vorticity contours for all five cross sections. Figure 17 shows that these vortices are the most persistent feature of a jet in a crossflow. They are clearly in evidence in that figure whereas the other properties have decayed to a degree that it is difficult to detect their deviation from free-stream values. The vortices are stronger for an effective velocity ratio of 8 than for a velocity ratio of 4, as indicated by comparing figures 14 and 16. In figures 15, 16, and 17, there is evidence of an axial flow in the core of each

vortex which decays less rapidly than the center-line speed. This axial speed in the vortex core actually exceeds the center-line speed in figures 16 and 17. The vortex core is also characterized by negative static-pressure coefficients in all three cross sections for $R = 8$. For an effective velocity ratio of 4, the vortices are apparently not as well developed. There is no evidence of axial flow in the vortex core for either cross section (figs. 13(b) and 14(b)). The negative static pressure associated with the vortex core is apparent in figure 13 but not in figure 14. The strengths of the vortices at each cross section can be estimated by calculating the flux of vorticity through the half-plane $y \geqq 0$. This calculation yields the following results:

Figure	13	14	15	16	17
$\Gamma/2DU_\infty$	1.7	1.1	5.0	4.8	3.1

Such a direct calculation from measured velocities has the disadvantage that the extent of measurements may not be large enough to account for all the vorticity. With the exception of figure 17, these cross sections appear to be large enough to account for almost all the vorticity. The direct calculations indicate that the vortex strength is a function not only of effective velocity ratio, but also of cross-section location.

Although the information presented in figures 13 to 17 provides some insight into the nature of the flow for a jet in a crossflow, the figures fall far short of providing a usable quantitative description of the flow for a range of effective velocity ratios. These figures do serve, however, to identify the distribution of vorticity as both the simplest and most persistent feature of a jet in a crossflow.

Measurements in Vertical Sections

In an attempt to learn something about the wake region velocity and pressure distribution, measurements were made in a few vertical sections for effective velocity ratios of 4 and 8. The rake of probes was positioned so that the lowest probe was 0.25D above the flat plate. In particular, evidence was being sought for a pair of relatively weak vortices that extend downstream from the jet orifice and remain quite close to the plate. (See ref. 34.) Measurements were made in the vertical sections $x/D = 4$, 6, and 8 for both velocity ratios and at $x/D = 12$ for an effective velocity ratio of 8. The measured velocities and pressures are presented in appendix C. (See table C3.)

Figures 18 and 19 present the results of measurements in the vertical section $x/D = 4$ for effective velocity ratios of 4 and 8. The information is presented as contour and arrow plots as described in the previous section with the exception that the vorticity and C_p contour plots are omitted due to their lack of information. The proximity of the jet plume to the flat plate for $R = 4$ appears to cause significant qualitative differences in the wake region in comparison with the wake region for $R = 8$. For $R = 4$, the vortex curve intersects the vertical section at $z/D = 3.1$ $(z_B/D = 1.3)$ as shown in fig-

ure 18. For $R = 8$, however, the vortex curve intersects the vertical section at $z/D = 6.6$ which is considerably above the region of measurement shown in figure 19.

The wake region, as evidenced by negative total-pressure coefficients, extends to the flat plate as shown in the (a) parts of figures 18 and 19. In the vicinity of the symmetry plane, the wake region for an effective velocity ratio of 4 is characterized by more negative values of the total-pressure coefficient than for a velocity ratio of 8. For $R = 4$, the contours of constant total pressure are approximately vertical from about 0.5D above the plate to the region influenced by the vortex pair. This result implies a very small vertical gradient of total pressure in this region. The wake appears to spread laterally in the region immediately above the plate as evidenced by the outward curve of total-pressure contours as they approach the plate. For $R = 8$, there are noticeable vertical gradients of the total pressure. A spreading of the wake near the plate similar to that for $R = 4$ is observed, but the total pressure continues to increase with increasing vertical distance throughout the region of measurement. This condition can be characterized as a pinching of the wake region between the flat plate and the vortex system.

The velocity induced by the contrarotating vortex pair is seen clearly from the arrow plots in the (b) parts of figures 18 and 19. Calculation of the x-component of the vorticity from the measured velocities indicates no significant vorticity other than that due to the vortex pair near the top of figure 18(b) for $R = 4$. For $R = 8$, the region of significant vorticity lies a few jet diameters above the region of measurement. The bottom row of arrows for each figure, however, suggests the possibility of a very weak and very small vortex system near the symmetry plane ($y = 0$) and within $D/4$ of the flat plate. It is important to note that in neither figure does the region of measurable vorticity extend to the immediate vicinity of the flat plate. For the purposes of calculating the flat-plate pressure distribution, it should, therefore, be possible to account for the effect of the diffuse vortex pair by treating them as vortex filaments.

The measurements from other vertical sections in the wake region are qualitatively similar to those presented in figures 18 and 19. As one would expect, there is a gradual recovery in total pressure and in the x-component of the velocity, but the deficit in each remains measurable.

SUMMARY OF RESULTS

The purpose of the present investigation is to make available a detailed description of the flow field induced by a jet in a crossflow and to provide a quantitative description of the vortex system which forms a prominent and persistent feature of the flow field. To accomplish this, velocity measurements were made in numerous cross sections for a range of velocity ratios. From these measurements the simplifying features of the vorticity distribution were noted and modeled. The inferred vortex properties are presented in a paper by the authors (AIAA J., vol. 12, no. 12, 1974). By using these models, the distribution of vorticity could be determined in a given cross section by a relatively

small number of velocity measurements. The specific results of the present study are:

1. The jet center-line location and the decay of the jet center-line speed are determined for a range of velocity ratios from 3 to 10. These are well-established properties of a jet in a crossflow and the agreement between the results of the present study and those of other experiments is satisfactory.

2. An alternate means of locating the jet plume, called the vortex curve, is presented. This curve locates the trajectory of the vortex pair associated with the jet, and it is experimentally detectable farther downstream than the jet center line. The vortex curve lies between the center line and the flat plate.

3. Measured values of total pressure, static pressure, and velocity are presented for 188 jet cross sections over a range of velocity ratios from 3 to 10 and from 2 to 45 jet diameters downstream of the jet orifice. Vertical sections near the flat plate are presented at an additional seven locations for velocity ratios of 4 and 8.

4. Extensive measurements in two cross sections for a velocity ratio of 4 and in three cross sections for a velocity ratio of 8 illustrate clearly the presence of a pair of diffuse contrarotating vortices which decrease in strength with increasing distance from the jet orifice. At a given downstream location the strength of one of the vortices for a velocity ratio of 8 is four to five times as strong as for a velocity ratio of 4. There is a measurable low static pressure in the cores of the vortices for a velocity ratio of 8 and also an axial flow in the vortex core which exceeds that of the region outside the core.

Langley Research Center
National Aeronautics and Space Administration
Hampton, VA 23665
November 9, 1977

REFERENCES

1. Otis, James H., Jr.: Induced Interference Effects on a Four-Jet VTOL Configuration With Various Wing Planforms in the Transition Speed Range. NASA TN D-1400, 1962.

2. Vogler, Raymond D.: Interference Effects of Single and Multiple Round or Slotted Jets on a VTOL Model in Transition. NASA TN D-2380, 1964.

3. Hickey, David H.; Kirk, Jerry V.; and Hall, Leo P.: Aerodynamic Characteristics of a V/STOL Transport Model With Lift and Lift-Cruise Fan Power Plants. Conference on V/STOL and STOL Aircraft, NASA SP-116, 1966, pp. 81-96.

4. Spreeman, Kenneth P.: Free-Stream Interference Effects on Effectiveness of Control Jets Near the Wing Tip of a VTOL Aircraft Model. NASA TN D-4084, 1967.

5. Margason, Richard J.; and Gentry, Garl L., Jr.: Aerodynamic Characteristics of a Five-Jet VTOL Configuration in the Transition Speed Range. NASA TN D-4812, 1968.

6. Barrack, Jerry P.; and Kirk, Jerry V.: Low-Speed Characteristics of High-Performance Lift-Engine V/STOL Aircraft. [Preprint] 680644, Soc. Automot. Eng., Oct. 1968.

7. Winston, Matthew M.: Wind-Tunnel Data From a 0.16-Scale V/STOL Model With Direct-Lift and Lift-Cruise Jets. NASA TM X-1748, 1969.

8. Carter, Arthur W.: Effects of Jet-Exhaust Location on the Longitudinal Aerodynamic Characteristics of a Jet V/STOL Model. NASA TN D-5333, 1969.

9. Mineck, Raymond E.; and Margason, Richard J.: Pressure Distribution on a Vectored-Thrust V/STOL Fighter in the Transition-Speed Range. NASA TM X-2867, 1974.

10. Callaghan, Edmund E.; and Ruggeri, Robert S.: Investigation of the Penetration of an Air Jet Directed Perpendicularly to an Air Stream. NACA TN 1615, 1948.

11. Ruggeri, Robert S.; Callaghan, Edmund E.; and Bowden, Dean T.: Penetration of Air Jets Issuing From Circular, Square, and Elliptical Orifices Directed Perpendicularly to an Air Stream. NACA TN 2019, 1950.

12. Jordinson, R.: Flow in a Jet Directed Normal to the Wind. R. & M. No. 3074, Brit. A.R.C., 1958.

13. Keffer, J. F.; and Baines, W. D.: The Round Turbulent Jet in a Cross-Wind. J. Fluid Mech., vol. 15, pt. 4, Apr. 1963, pp. 481-497.

14. Margason, Richard J.: The Path of a Jet Directed at Large Angles to a Subsonic Free Stream. NASA TN D-4919, 1968.

15. Thompson, A. M.: The Flow Induced by Jets Exhausting Normally From a Plane Wall Into an Airstream. Ph. D. Thesis, Univ. of London, 1971.

16. Kamotani, Yasuhiro, and Greber, Isaac: Experiments on a Turbulent Jet in a Cross Flow. AIAA J., vol. 10, no. 11, Nov. 1972, pp. 1425-1429.

17. Kamotani, Yasuhiro, and Greber, Isaac: Experiments on a Turbulent Jet in a Cross Flow. FTAS/TR-71-62 (NASA Grant NGR-36-027-008), Case Western Reserve Univ., June 1971. (Available as NASA CR-72893.)

18. Vogler, Raymond D.: Surface Pressure Distributions Induced on a Flat Plate by a Cold Air Jet Issuing Perpendicularly From the Plate and Normal to a Low-Speed Free-Stream Flow. NASA TN D-1629, 1963.

19. Bradbury, L. J. S.; and Wood, M. N.: The Static Pressure Distribution Around a Circular Jet Exhausting Normally From a Plane Wall Into an Airstream. C.P. No. 822, Brit. A.R.C., 1965.

20. Gelb, G. H.; and Martin, W. A.: An Experimental Investigation of the Flow Field About a Subsonic Jet Exhausting Into a Quiescent and a Low Velocity Air Stream. Can. Aeronaut. & Space J., vol. 12, no. 8, Oct. 1966, pp. 333-342.

21. Wu, J. C.; McMahon, H. M.; Mosher, D. K.; and Wright, M. A.: Experimental and Analytical Investigations of Jets Exhausting Into a Deflecting Stream. J. Aircraft, vol. 7, no. 1, Jan.-Feb. 1970, pp. 44-51.

22. Soullier, A.: Testing at S1.MA for Basic Investigations on Jet Interactions. Distribution of Pressures and Velocities in the Jet Using the Ideal Standard Nozzle (in Unheated State). NASA TT F-14072, 1972.

23. Soullier, A.: Testing at S1.MA for Basic Investigations on Jet Interactions Distribution of Pressures Around the Jet Orifice. NASA TT F-14066, 1972.

24. Ousterhout, Donald S.: An Experimental Investigation of a Cold Jet Emitting From a Body of Revolution Into a Subsonic Free Stream. NASA CR-2089, 1972.

25. Fearn, Richard; and Weston, Robert P.: Induced Pressure Distribution of a Jet in a Crossflow. NASA TN D-7916, 1975.

26. Harms, L.: Experimental Investigation of the Flow Field of a Hot Turbulent Jet With Lateral Flow. Part II. NASA TT F-15706, 1974.

27. Fearn, Richard; and Weston, Robert P.: Vorticity Associated With a Jet in a Cross Flow. AIAA J., vol. 12, no. 12, Dec. 1974, pp. 1666-1671.

28. Margason, Richard J.; and Fearn, Richard: Jet-Wake Characteristics and Their Induced Aerodynamic Effects on V/STOL Aircraft in Transition Flight. Analysis of a Jet in a Subsonic Crosswind, NASA SP-218, 1969, pp. 1-18.

29. Rubbert, P. E.; and Saaris, G. R.: A General Three-Dimensional Potential-Flow Method Applied to V/STOL Aerodynamics. [Preprint] 680304, Soc. Automot. Eng., Apr.-May 1968.

30. Wooler, P. T.; Kao, H. C.; Schwendemann, M. F.; Wasson, H. R.; and Ziegler, H.: V/STOL Aircraft Aerodynamic Prediction Methods. Vol. I - Thoretical Developments of Prediction Methods. AFFDL-TR-72-26, Vol. I, U.S. Air Force, Jan. 1972.

31. Smith, Richard H.; and Wang, Chi-Teh: Contracting Cones Giving Uniform Throat Speed. J. Aeron. Sci., vol. 11, no. 4, Oct. 1944, pp. 356-360.

32. Saha, Pranab: Characteristics of a Round Turbulent Free Jet. M.S. Thesis, University of Florida, 1975.

33. Albertson, M. L.; Dai, Y. B.; Jensen, R. A.; and Rouse, Hunter: Diffusion of Submerged Jets. Paper No. 2409, Trans. American Civil Eng., vol. 115, 1950, pp. 639-644.

34. Flows With Large Velocity Fluctuations. ONERA Film No. 575.

TABLE 1.- SOME RECENT EXPERIMENTS WITH MEASUREMENTS IN JET CROSS SECTIONS

Investigators	Jet diameters, cm	Tunnel test-section size, D	Effective velocity ratios	Number of cross sections	Approximate number of velocity and pressure determinations	Typical grid size, D
Kamotani and Greber, 1971 (refs. 16 and 17)[a]	0.64	112 × 112	4 6 8	2 3 3	100 150 150	1 × 1
Thompson, 1971 (ref. 15)	2.54	48 × 60	2 4 8	5 5 4	650 800 700	$\frac{1}{2} \times \frac{1}{2}$
Harms, 1973 (ref. 26)[a]	5.0	60 × 60	8	2	500	$\frac{1}{2} \times 1$
Present study	10.16	44 × 65	3 4 6 8 10	3 13 6 9 3	119 700 217 1358 126	$\frac{1}{2} \times \frac{1}{2}$

[a]Hot jets studied also but are not reflected in this table.

TABLE 2.- SUMMARY OF TEST CONDITIONS FOR PRESENT STUDY

R	U_∞, m/sec	M_j	Symmetry plane cross sections		Extended cross sections		Vertical sections	
			Number	Measurements	Number	Measurements	Number	Measurements
First test								
4	39	0.48	0	0	5	413	3	175
8	39	.93	0	0	3	945	4	364
Second test								
3	34	0.33	4	28	0	0		
3	53	.50	15	105	3	119		
4	25	.32	3	21	0	0		
4	39	.48	22	154	8	287		
4	62	.76	3	21	0	0		
5	50	.76	9	56	0	0		
6	26	.48	3	21	0	0		
6	42	.75	19	133	6	217		
6	51	.93	4	28	0	0		
7	44	.93	8	56	0	0		
8	19	.47	3	21	1	49		
8	31	.75	7	49	0	0		
8	39	.93	24	168	6	413		
10	25	.75	4	28	2	126		
10	31	.93	13	91	3	126		

TABLE 3.- JET CENTER-LINE DETERMINATION

R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Jet center line x/D	Jet center line z/D	φ_C, deg (a)	$U_℄/U_\infty$	R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Jet center line x/D	Jet center line z/D	φ_C, deg (a)	$U_℄/U_\infty$
R = 3																	
[b]3.2	51	1.98	3.25	22.0	1.92	3.39	31.7	2.01	3.2	53	7.84	5.22	11.0	7.71	5.87	13.8	1.14
3.2	51	2.00	3.25	28.0	1.91	3.41	31.8	2.16	3.2	53	9.50	5.50	10.0	9.36	6.28	12.2	1.08
3.2	52	3.85	4.24	16.0	3.81	4.36	21.4	1.49	3.2	53	12.08	7.00	9.0	12.11	6.79	10.3	1.05
3.2	53	5.96	4.25	12.9	5.75	5.17	16.6	1.22	3.2	53	14.12	7.50	8.0	14.16	7.22	9.3	1.06
R = 4																	
[b]4.1	38	1.97	4.25	28.0	1.90	4.38	37.9	1.83	4.1	40	7.87	6.75	14.0	7.83	6.91	17.0	1.21
4.2	38	2.00	4.25	33.0	1.89	4.41	38.6	1.95	[b]4.0	39	8.44	6.78	11.0	8.41	6.93	15.9	1.16
[b]4.0	39	2.66	4.63	31.8	2.61	4.72	31.7	1.62	4.1	40	12.05	8.00	12.0	12.07	7.90	12.9	1.11
4.1	39	3.88	5.00	20.0	3.73	5.41	26.5	1.53	4.1	40	14.00	8.25	10.5	13.95	8.53	11.8	1.06
[b]4.0	39	5.20	5.81	21.3	5.13	5.98	21.5	1.28	[b]4.0	39	15.78	8.60	10.0	15.82	8.38	10.6	1.05
4.2	38	5.82	5.74	17.0	5.62	6.40	21.2	1.26	4.1	39	18.01	8.75	10.2	17.98	8.93	10.0	1.04
R = 5																	
5.1	49	1.97	5.25	33.0	1.99	5.22	42.6	2.12	5.1	51	9.71	9.78	15.0	9.90	9.05	17.7	1.17
5.1	49	6.03	7.25	20.0	5.63	7.80	24.3	1.34	5.1	51	14.12	10.00	13.0	14.06	10.25	14.2	1.08
R = 6																	
6.0	41	1.89	6.50	38.0	2.08	6.26	46.0	2.13	6.0	42	11.93	11.50	17.0	11.96	11.40	18.0	1.12
6.0	41	3.91	7.50	28.0	3.74	7.82	35.1	1.53	6.0	42	14.02	11.50	15.0	13.86	12.09	16.5	1.08
6.1	41	6.10	9.00	24.0	6.06	9.09	27.4	1.38	[b]6.1	42	18.08	13.50	14.0	18.51	11.77	13.9	1.04
6.0	42	7.75	10.49	20.0	7.90	10.09	23.2	1.26									
6.1	42	9.63	11.50	18.0	9.88	10.72	20.6	1.20	[b]6.1	53	14.02	11.50	15.0	13.88	12.03	16.7	1.10

See footnotes at end of table, p. 25.

TABLE 3.- Concluded

R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Jet center line x/D	Jet center line z/D	φ_c, deg (a)	$U_⊄/U_\infty$	R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Jet center line x/D	Jet center line z/D	φ_c, deg (a)	$U_⊄/U_\infty$
R = 7																	
7.0	44	1.95	7.00	42.0	1.91	7.04	51.6	2.40	7.0	45	9.92	12.48	20.0	9.88	12.59	23.0	1.16
7.0	44	5.95	10.00	27.0	5.68	10.53	31.5	1.40	7.0	45	13.88	13.95	17.5	13.84	14.03	18.8	1.10
R = 8																	
[b]8.0	31	1.80	7.95	52.0	1.91	7.87	54.9	2.72	8.0	38	3.79	9.97	35.0	3.64	10.19	42.9	1.78
[b]8.0	31	2.00	6.75	44.7	1.51	7.25	59.0	2.81	8.1	38	6.05	11.0	30.0	5.65	11.70	35.1	1.53
[b]8.0	32	14.00	15.30	20.0	13.87	15.65	21.0	1.13	[b]8.0	39	6.53	11.35	30.0	6.18	11.96	33.2	1.47
									8.1	39	7.69	12.49	26.0	7.39	13.11	30.5	1.33
[b]8.1	38	2.03	6.75	45.0	1.45	7.33	59.9	2.98	8.0	39	9.96	13.50	23.0	9.69	14.13	25.9	1.22
[b]8.0	38	2.00	6.75	44.7	1.44	7.31	59.8	2.91	8.1	39	11.98	14.00	21.0	11.68	14.78	23.5	1.20
[b]8.1	39	2.00	8.00	51.9	1.92	8.06	55.1	2.63	8.0	39	14.00	15.30	20.0	13.76	15.96	21.1	1.11
8.0	38	2.00	8.00	52.2	1.89	8.09	55.1	2.65	[b]8.0	39	18.14	16.50	18.0	17.85	17.39	18.0	1.10
[b]8.0	39	3.69	9.41	41.9	3.40	9.74	44.2	1.96									
R = 10																	
[b]10.0	25	2.00	9.50	57.4	1.82	9.62	60.9	3.18	10.0	31	6.06	13.50	34.8	5.58	14.20	40.6	1.82
[b]10.1	25	14.03	17.50	25.0	13.83	17.93	25.4	1.23	10.0	31	7.99	14.50	31.0	7.52	15.29	35.1	1.59
									10.0	31	10.16	15.47	28.0	9.40	16.89	31.3	1.44
10.0	31	2.00	9.50	57.4	1.82	9.62	60.9	3.21	[b]10.0	31	12.11	16.50	25.0	11.5	17.7	28.0	1.30
10.0	31	4.00	11.48	41.0	3.54	12.00	49.2	2.27	10.0	32	14.03	17.50	25.0	13.18	19.33	25.9	1.21

[a]Calculated from equation (2) for jet center line.
[b]Not used to determine parameters in equation (2) for jet center line.

TABLE 4.- VORTEX-CURVE DETERMINATION

R	U_∞, m/sec	Rake location			Vortex curve				R	U_∞, m/sec	Rake location			Vortex curve			
		x/D	z/D	φ_B, deg	x/D	z/D	s/D	φ_V, deg (a)			x/D	z/D	φ_B, deg	x/D	z/D	s/D	φ_V, deg (a)
R = 3																	
[b]3.2	34	2.00	2.00	22.0	2.19	1.54	2.90	26.5	3.2	53	8.00	3.00	13.0	7.99	3.05	8.95	9.2
[b]3.2	34	6.00	3.00	12.9	6.06	2.74	7.02	11.2	3.2	53	8.00	3.48	11.0	8.07	3.09	9.05	9.2
[b]3.2	34	8.00	3.00	13.0	7.98	3.10	8.95	9.2	3.2	53	9.48	3.75	10.0	9.56	3.24	10.55	8.1
[b]3.2	34	14.00	4.50	8.0	14.11	3.71	15.14	6.3	3.2	53	12.00	4.00	9.0	12.06	3.63	13.07	6.9
3.2	51	2.00	2.00	22.0	2.18	1.56	2.90	26.5	3.2	53	14.00	4.50	8.0	14.09	3.88	15.12	6.3
3.2	52	4.00	2.50	16.0	4.07	2.27	4.95	15.2	3.2	53	18.00	5.00	7.1	18.10	4.23	19.14	5.3
3.2	53	6.00	3.00	12.9	6.07	2.69	7.01	11.2	[b]3.2	52	25.00	6.00	10.0	25.18	4.96	26.26	4.3
R = 4																	
[b]4.1	25	2.03	2.50	28.0	2.13	2.30	3.35	31.8	[b]4.0	39	9.22	3.88	15.0	9.07	4.43	10.59	10.2
[b]4.2	25	6.00	4.00	17.0	6.08	3.74	7.61	13.6	4.1	40	14.00	6.00	10.5	14.18	5.05	15.80	7.4
[b]4.2	26	14.00	6.00	10.5	14.18	5.02	15.83	7.4	4.1	39	18.00	6.50	10.2	18.15	5.67	19.82	6.3
4.1	38	2.03	2.50	28.0	2.11	2.35	3.36	31.8	[b]4.1	39	35.00	8.50	6.3	35.18	6.84	36.92	4.0
4.1	39	4.00	3.25	20.0	4.06	3.09	5.45	18.6	[b]4.1	62	2.03	2.50	28.0	2.20	2.18	3.33	31.8
4.2	38	6.00	4.00	17.0	6.05	3.85	7.59	13.6	[b]4.1	62	6.00	4.00	17.0	6.06	3.79	7.55	13.6
4.1	40	8.00	4.50	14.0	8.09	4.14	9.58	11.1	[b]4.1	65	14.00	6.00	10.5	14.18	5.05	15.75	7.4
4.2	40	9.10	4.75	13.0	9.15	4.52	10.76	10.1									

See footnotes at end of table, p. 28.

TABLE 4.- Continued

R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Vortex curve x/D	Vortex curve z/D	Vortex curve s/D	φ_V, deg (a)	R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Vortex curve x/D	Vortex curve z/D	Vortex curve s/D	φ_V, deg (a)
R = 5																	
5.0	50	2.00	2.99	32.6	2.07	2.88	3.75	41.2	5.1	51	9.68	5.98	15.0	9.74	5.74	11.98	12.4
5.1	49	2.05	3.00	33.0	2.17	2.81	3.79	40.6	5.1	51	14.00	7.00	13.0	14.11	6.52	16.43	9.5
5.1	49	6.00	5.00	20.0	6.07	4.80	8.21	17.5									
R = 6																	
[b]6.1	26	2.00	3.50	38.0	2.01	3.49	4.23	47.3	6.0	43	14.00	8.50	15.0	14.10	8.12	17.28	12.2
[b]6.1	26	6.00	6.00	24.0	6.01	5.97	8.95	21.7	6.1	42	18.00	10.00	14.0	18.24	9.06	21.54	10.2
[b]6.1	27	14.00	8.50	15.0	14.01	8.46	17.27	12.2	6.0	42	25.02	11.00	10.0	25.18	10.09	28.54	8.2
									[b]6.1	42	35.00	13.00	9.3	35.15	12.11	38.72	6.6
6.0	41	2.00	3.50	38.0	2.02	3.48	4.22	47.3	[b]6.0	42	35.00	13.00	9.5	35.26	11.43	38.74	6.6
6.0	41	4.00	5.00	28.0	4.03	4.95	6.71	28.9	[b]6.0	42	45.00	14.75	8.1	45.05	14.39	48.80	5.6
6.0	41	6.00	6.00	24.0	6.01	5.98	8.92	21.7									
6.0	42	8.00	7.00	20.0	8.18	6.51	11.14	17.7	[b]6.1	51	2.00	3.50	38.0	2.04	3.45	4.22	47.3
6.0	42	9.48	8.00	18.0	9.74	7.19	12.82	15.6	[b]6.1	51	6.00	6.00	24.0	5.93	6.15	8.94	21.7
6.0	42	12.00	8.50	17.0	12.20	7.85	15.37	13.4	[b]6.1	53	14.00	8.50	15.0	14.06	8.29	17.29	12.2
R = 7																	
7.0	44	2.00	4.00	41.6	1.96	4.04	4.68	55.2	7.0	45	9.88	8.98	20.0	9.95	8.77	14.00	19.0
7.0	44	2.00	4.00	42.0	2.04	3.96	4.65	55.2	7.0	45	14.00	10.45	17.5	14.16	9.94	18.34	15.0
7.0	44	6.00	7.00	27.0	5.90	7.20	9.70	26.8									

See footnotes at end of table, p. 28.

TABLE 4.- Concluded

R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Vortex curve x/D	Vortex curve z/D	Vortex curve s/D	φ_V, deg (a)
R = 8								
[b]8.2	19	2.00	5.00	45.0	2.11	4.89	5.53	51.2
[b]8.3	19	6.00	8.00	30.0	5.99	8.01	10.60	30.6
[b]8.0	20	15.18	11.98	20.0	15.42	11.31	20.52	18.1
[b]8.0	31	2.00	5.00	45.0	2.17	4.83	5.51	51.2
[b]8.0	31	2.00	6.75	44.7	2.79	5.95	6.76	44.2
[b]8.1	31	6.00	8.00	30.0	6.02	7.96	10.54	30.6
[b]8.0	32	15.18	11.98	20.0	15.26	11.73	20.51	18.1
8.1	39	2.00	5.00	45.0	2.10	4.90	5.53	51.2
8.0	38	4.00	6.98	35.0	4.01	6.97	8.31	37.2
R = 10								
[b]10.0	25	2.00	6.00	52.0	2.15	5.88	6.47	61.9
[b]10.0	25	2.03	6.00	51.9	2.13	5.92	6.49	61.8
[b]10.1	25	6.00	9.98	34.8	5.97	10.01	12.23	34.8
[b]10.1	25	14.00	14.00	25.0	14.20	13.56	21.32	20.4
10.0	31	2.03	6.00	51.9	2.14	5.92	6.49	61.8
[b]10.0	31	2.00	8.00	52.2	3.19	7.08	8.11	52.0

R	U_∞, m/sec	Rake location x/D	Rake location z/D	φ_B, deg	Vortex curve x/D	Vortex curve z/D	Vortex curve s/D	φ_V, deg (a)
R = 8								
[b]8.0	39	5.63	7.13	41.9	5.20	7.60	9.64	33.0
8.1	39	6.00	8.00	30.0	5.90	8.17	10.53	30.6
8.1	39	8.00	9.00	26.0	7.88	9.25	12.76	26.2
[b]8.0	39	8.81	8.31	30.0	8.34	9.12	13.12	25.6
8.0	39	9.80	10.00	23.0	9.76	10.10	14.79	23.2
8.0	39	12.00	11.00	21.0	11.97	11.07	17.20	20.7
8.0	39	15.18	11.98	20.0	15.20	11.91	20.51	18.1
8.0	39	18.00	13.00	18.0	18.13	12.61	23.50	16.4
8.0	39	25.00	16.00	15.2	25.30	14.88	31.02	13.4
8.1	39	35.00	18.00	14.9	35.23	17.13	41.19	11.0
8.0	39	45.00	19.50	10.7	45.13	18.81	51.22	9.5
R = 10								
9.9	31	4.00	8.48	41.0	4.03	8.44	9.70	43.9
10.0	31	6.00	9.98	34.8	5.98	10.00	12.21	34.8
10.0	31	8.00	11.00	31.0	7.81	11.32	14.45	29.4
10.0	31	10.00	11.98	28.0	9.89	12.18	16.71	25.5
10.0	31	12.08	13.50	25.0	12.20	13.24	19.27	22.3
10.0	32	14.00	14.00	25.0	14.03	13.93	21.24	20.4
10.0	31	18.00	16.00	22.0	18.26	15.37	25.76	17.2

[a]Calculated from equation (2) for vortex curve.
[b]Not used to determine parameters in equation (2) for vortex curve.

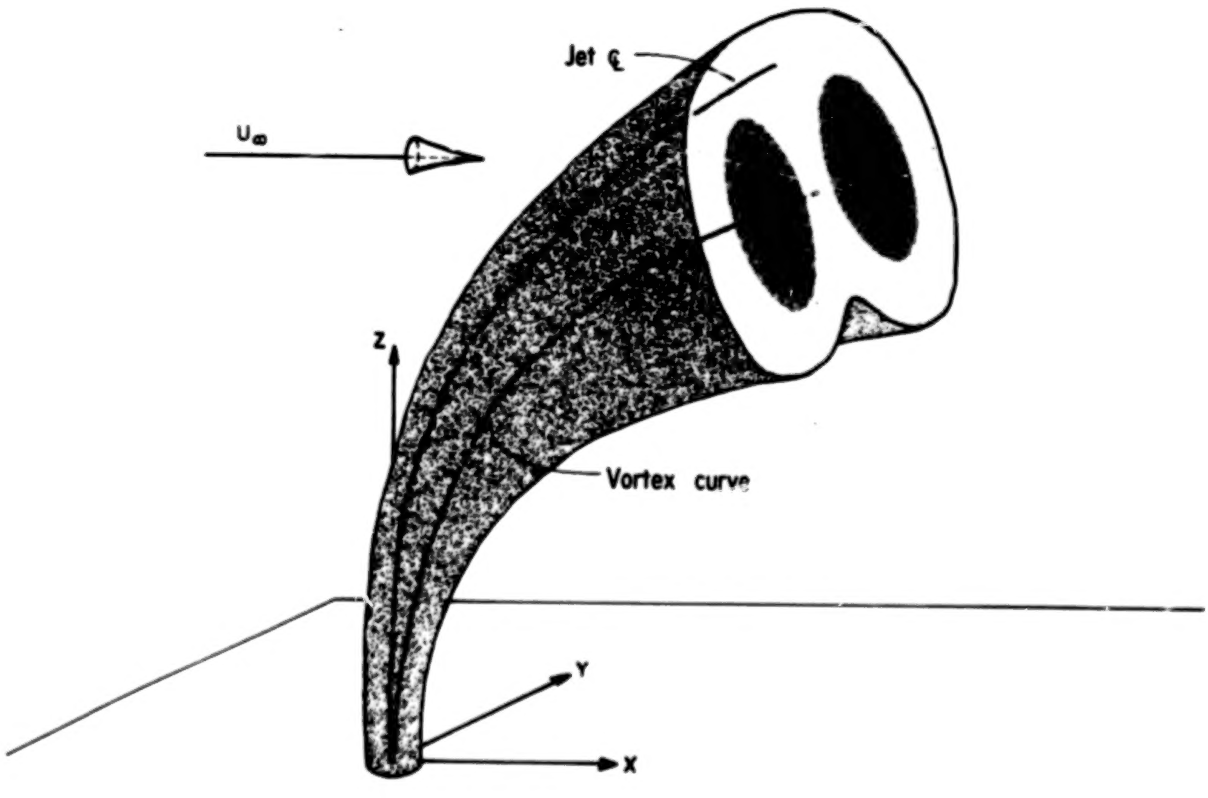


Figure 1.- Sketch of a jet in a crossflow.

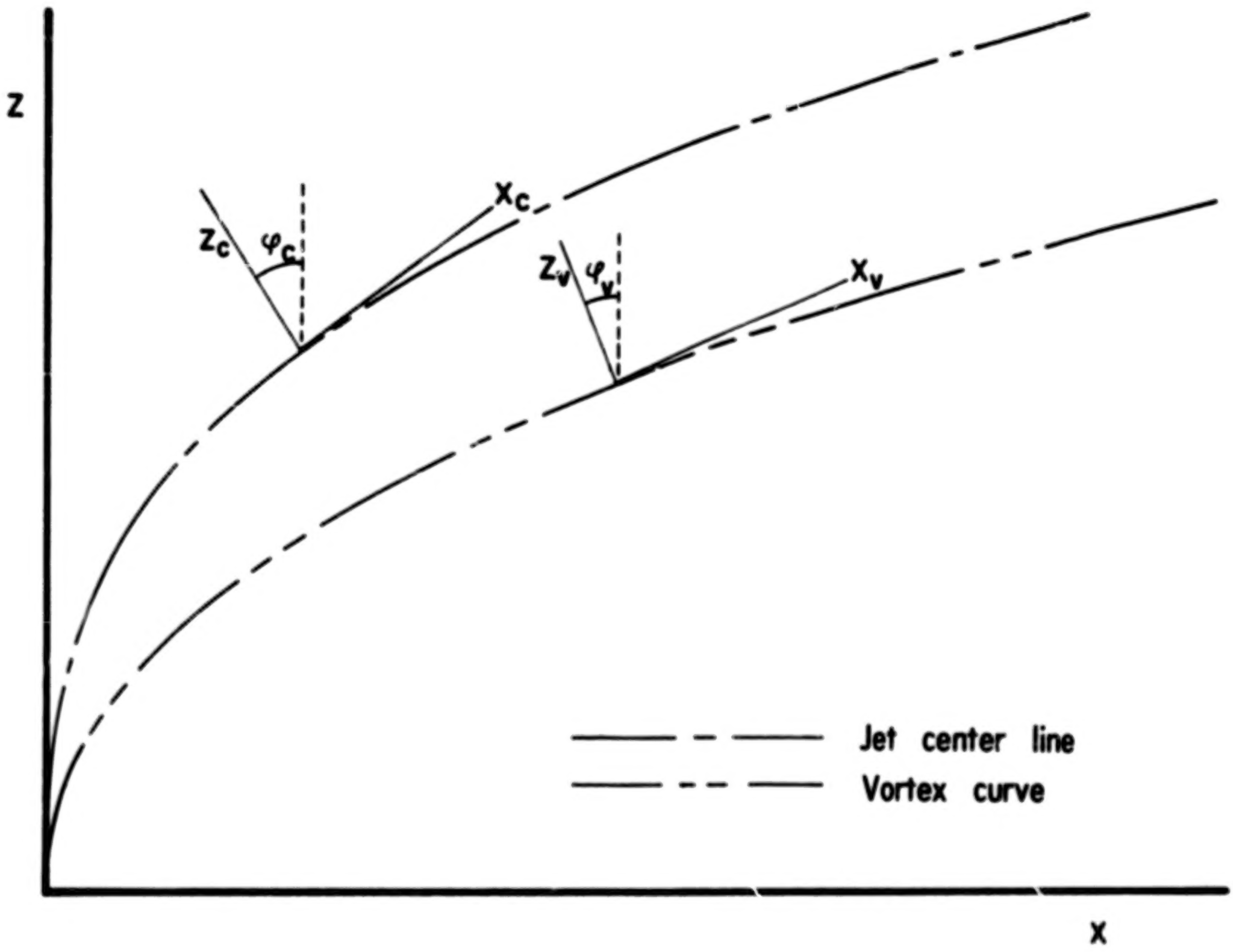


Figure 2.- Jet center line and vortex curve with associated coordinates systems.

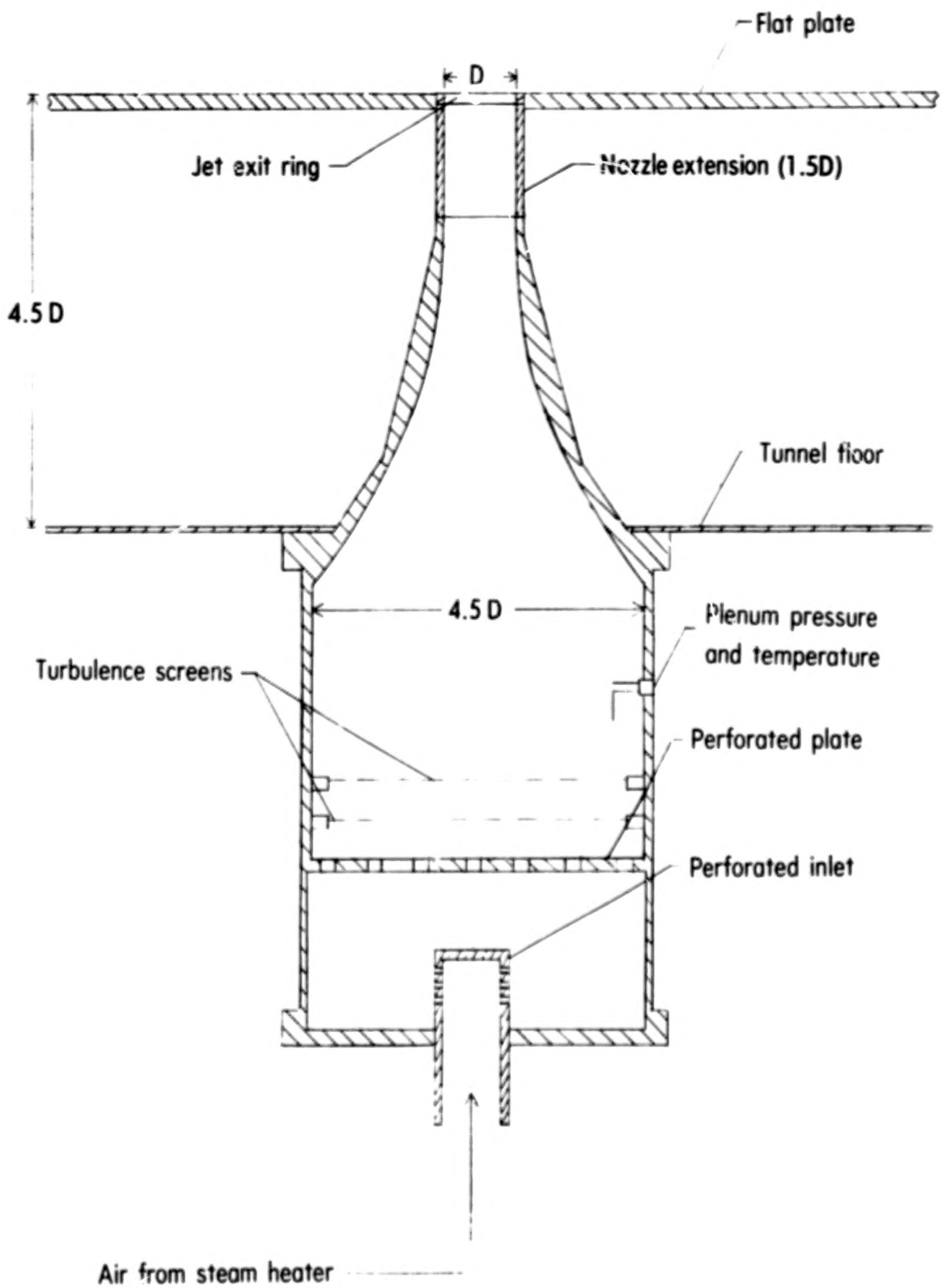


Figure 3.- Jet nozzle and plenum.

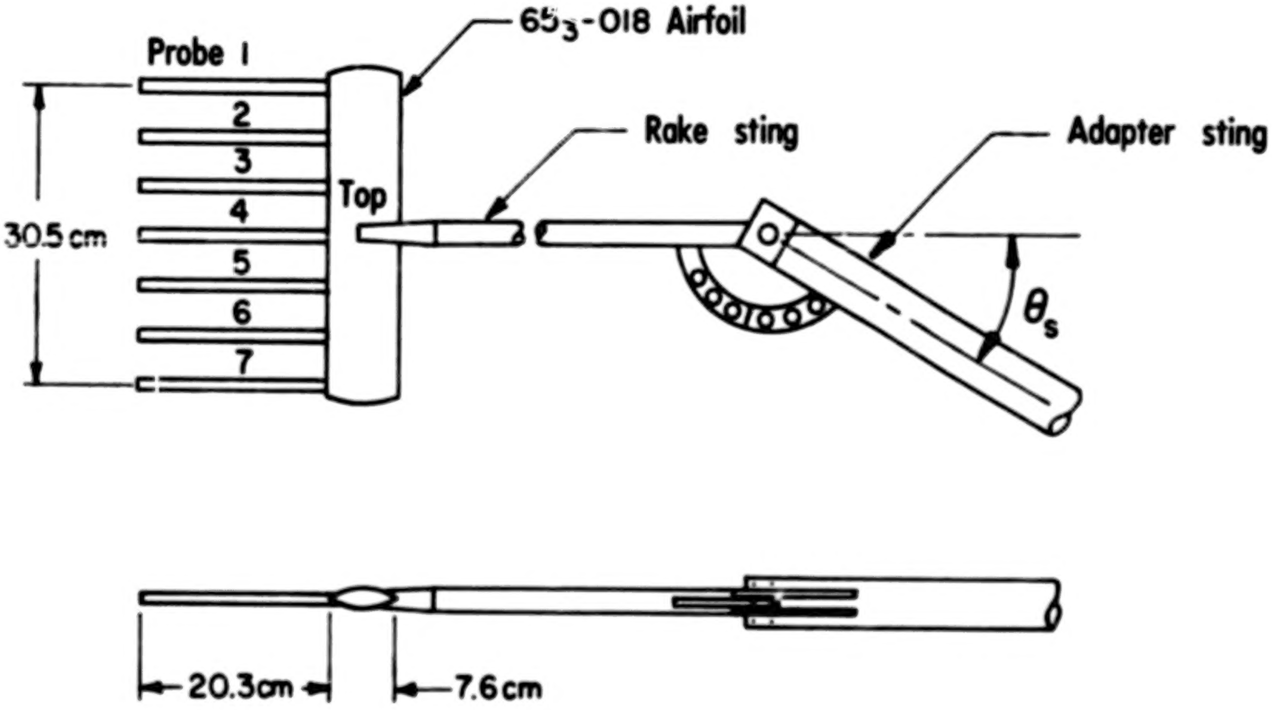


Figure 4.- Rake of yaw-pitch probes.

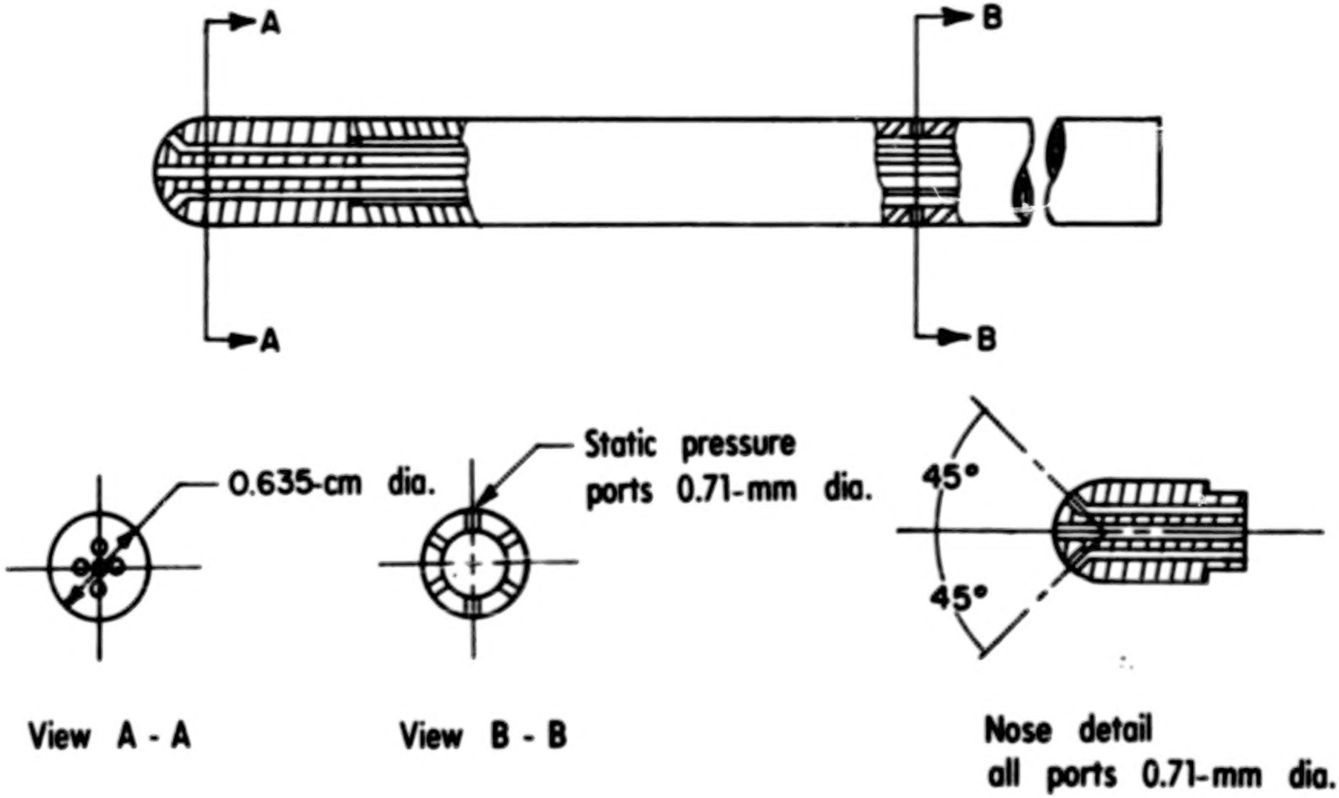
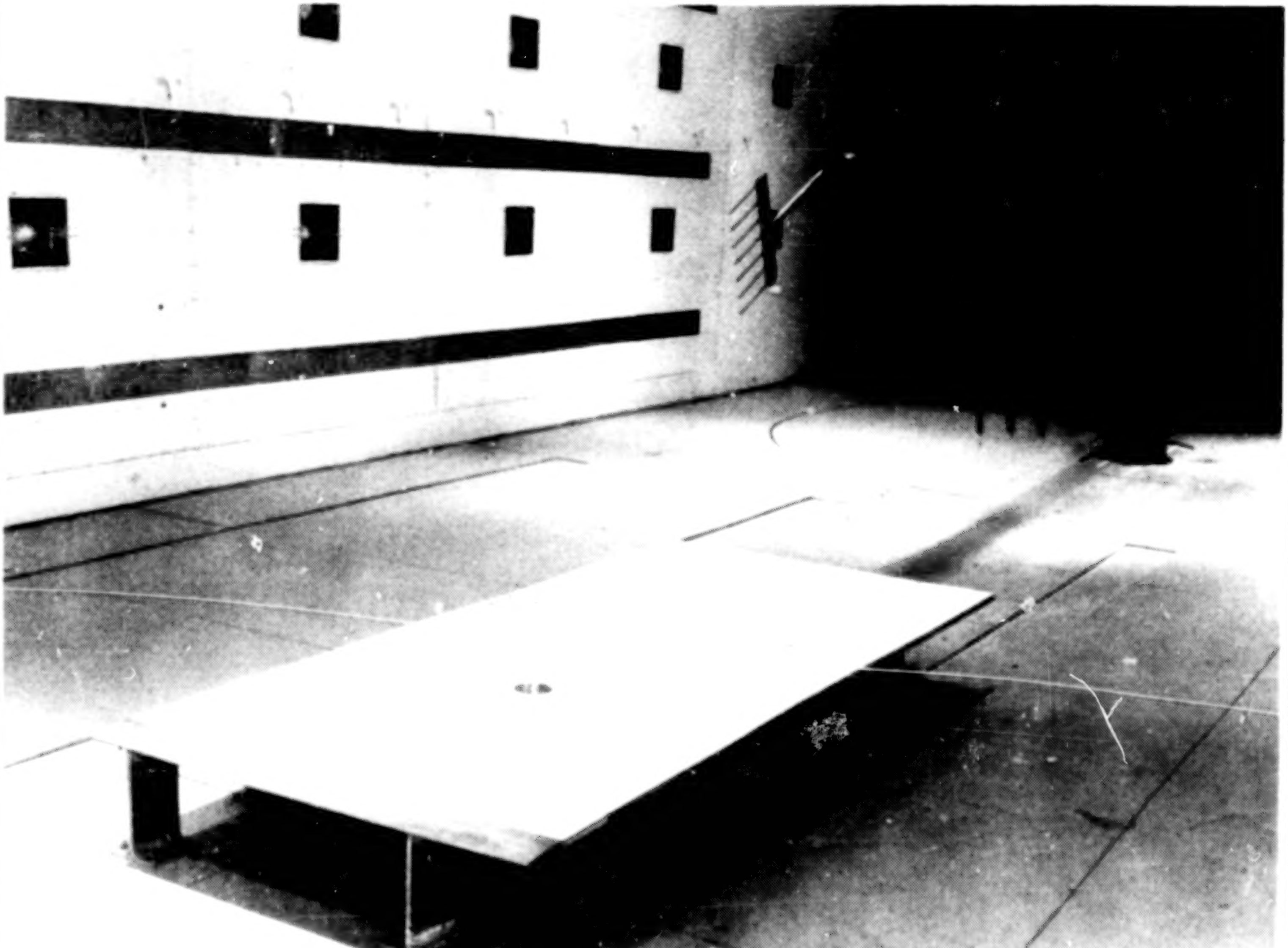


Figure 5.- Yaw-pitch probe.



L-73-640

Figure 6.- Experimental arrangement in V/STOL tunnel for jet in a crossflow experiment.

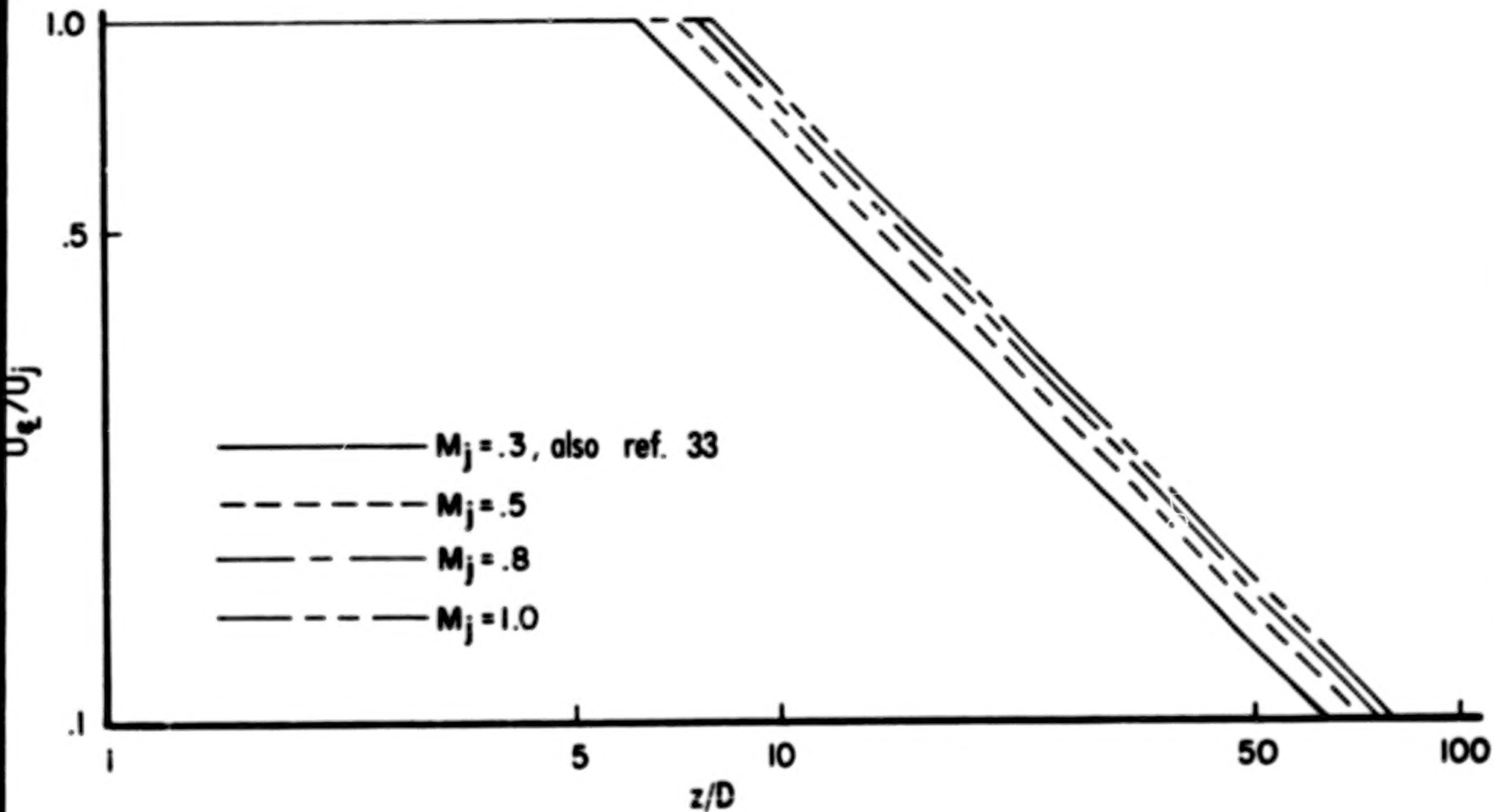
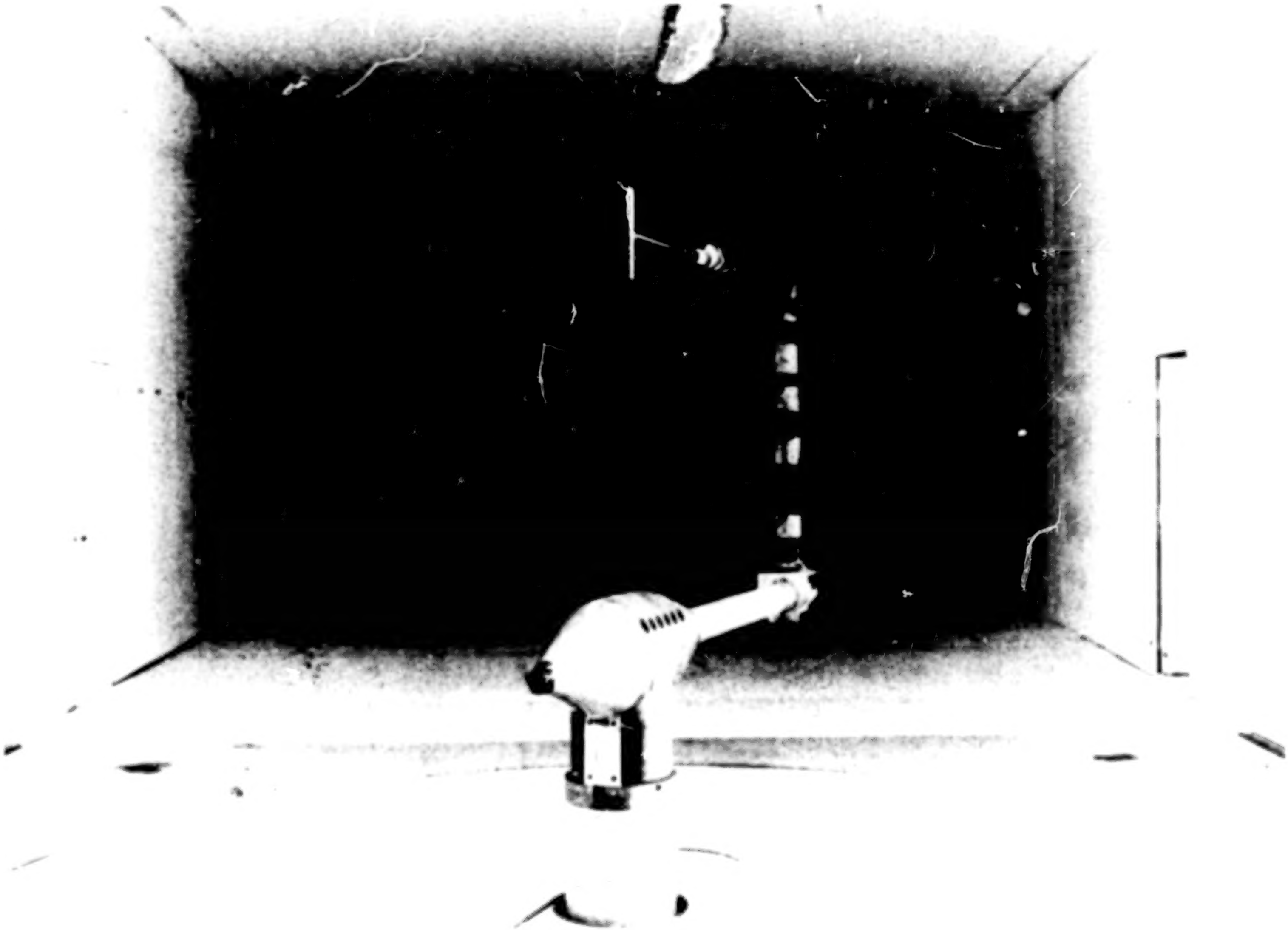
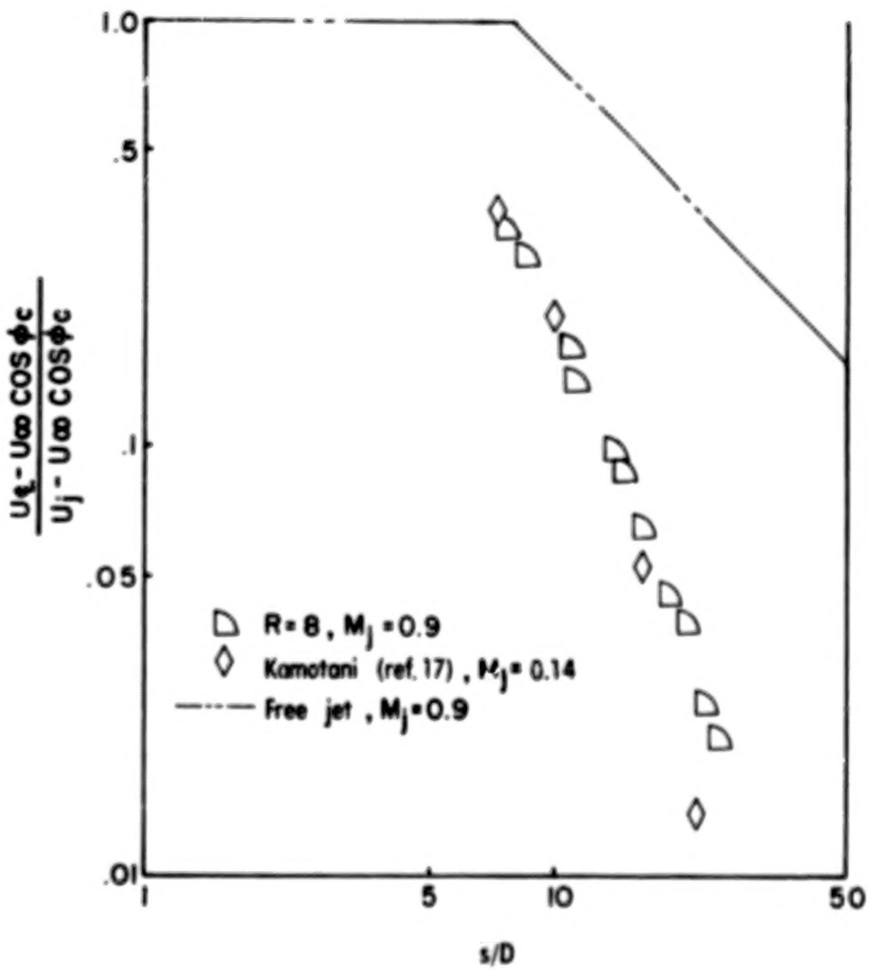


Figure 7.- Measured decay of jet center line velocity with no crossflow.



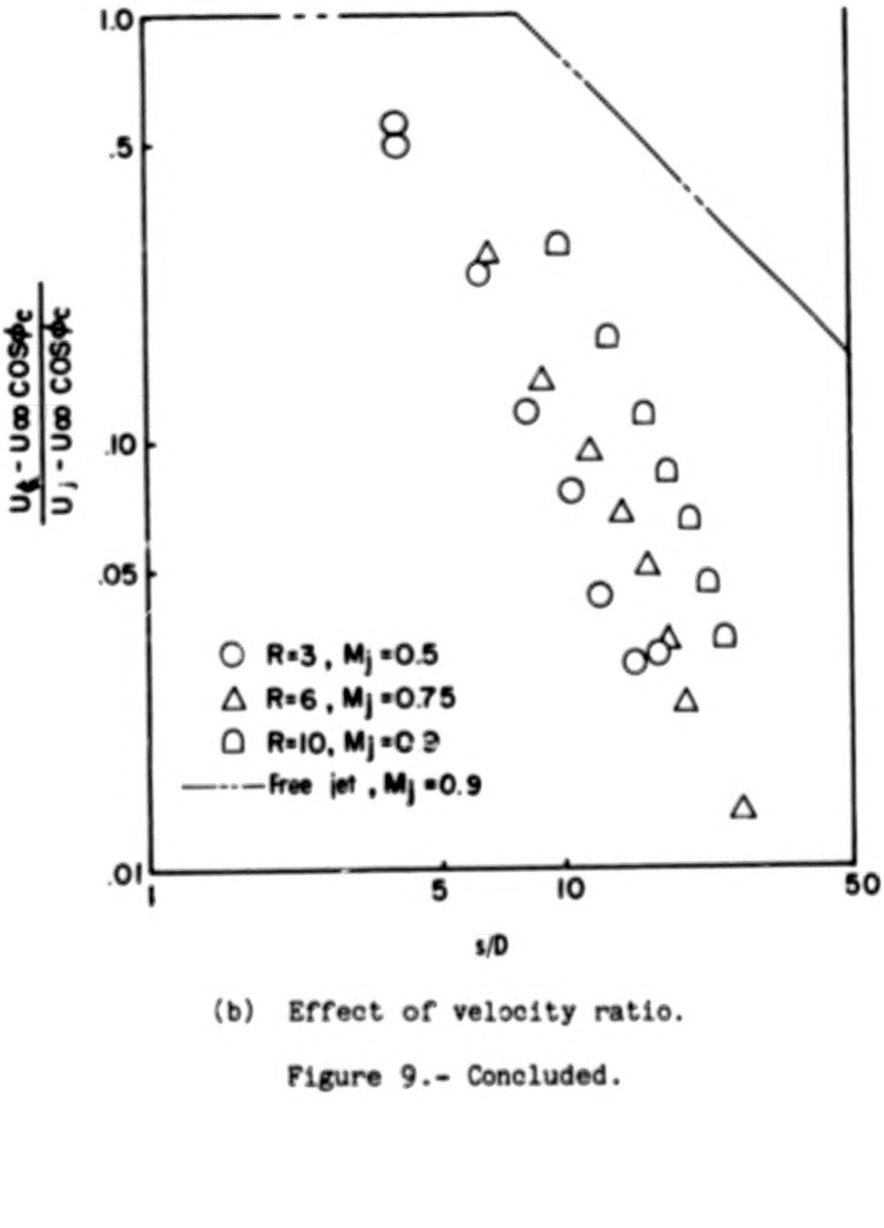
L-72-4730

Figure 8.- Experimental arrangement in V/STOL tunnel for probe calibration.



(a) Comparison with Kamotani, R = 8.

Figure 9.- Decay of jet center-line speed.



(b) Effect of velocity ratio.

Figure 9.- Concluded.

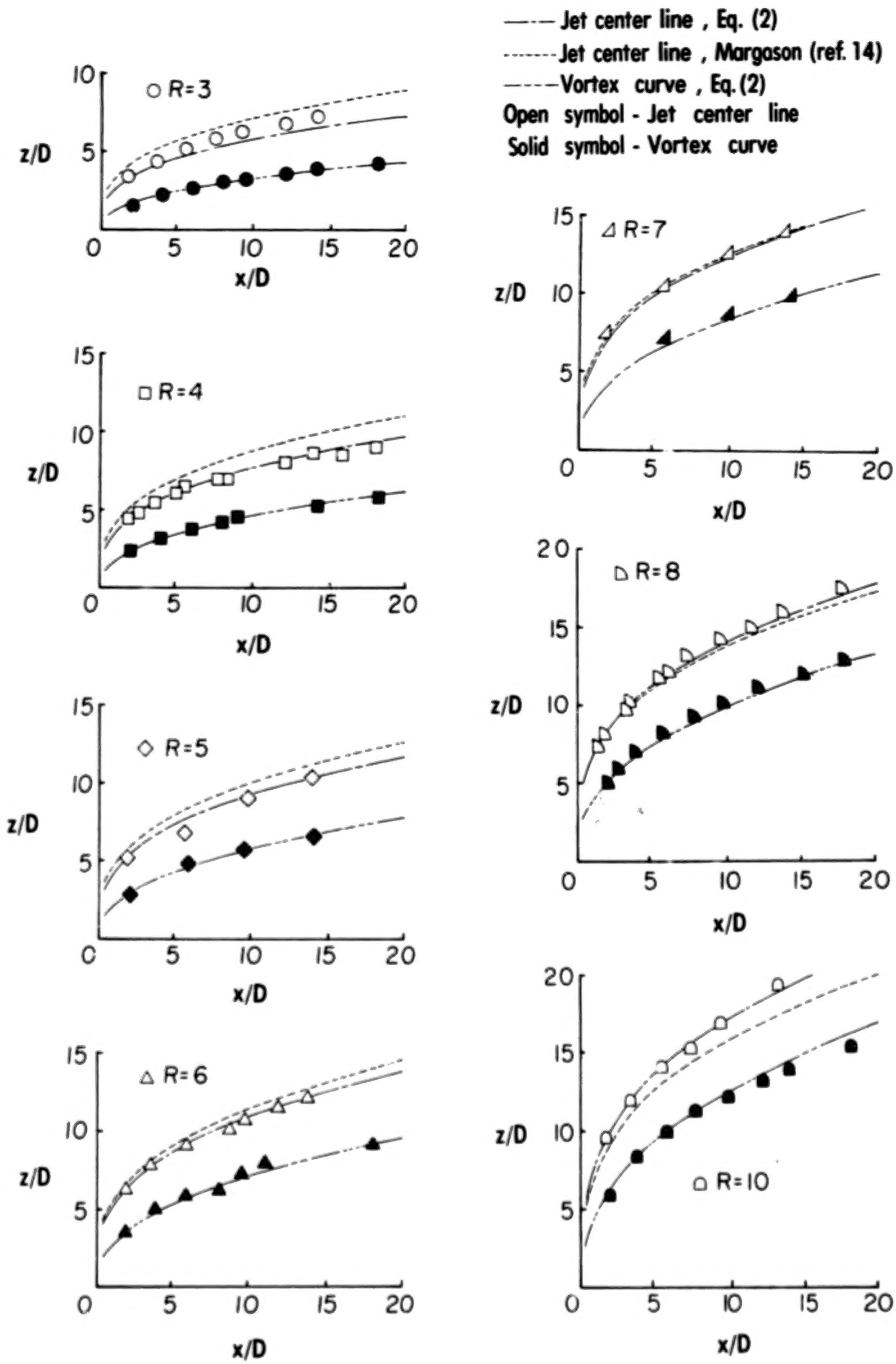


Figure 10.- Jet center lines and vortex curves.

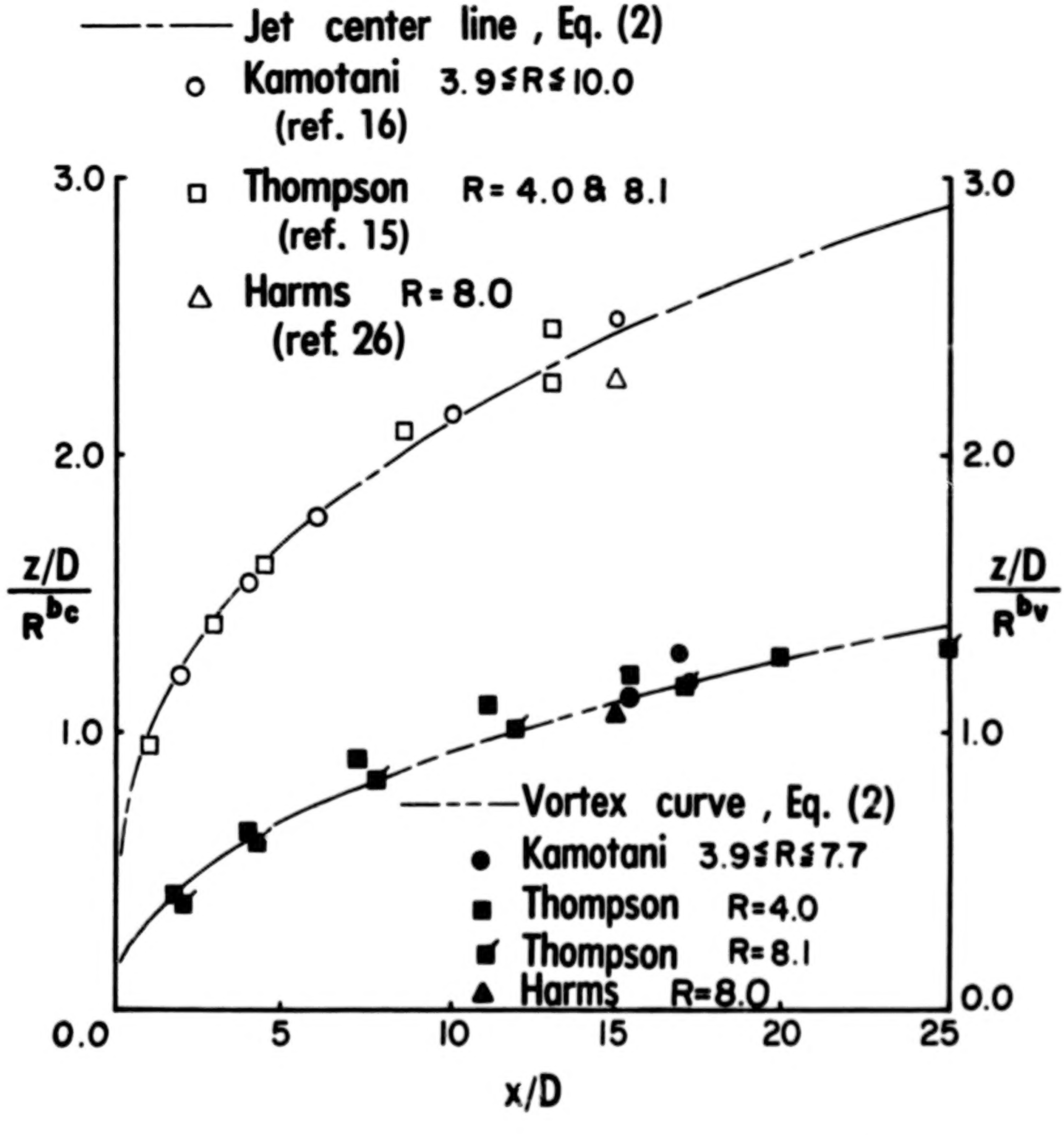
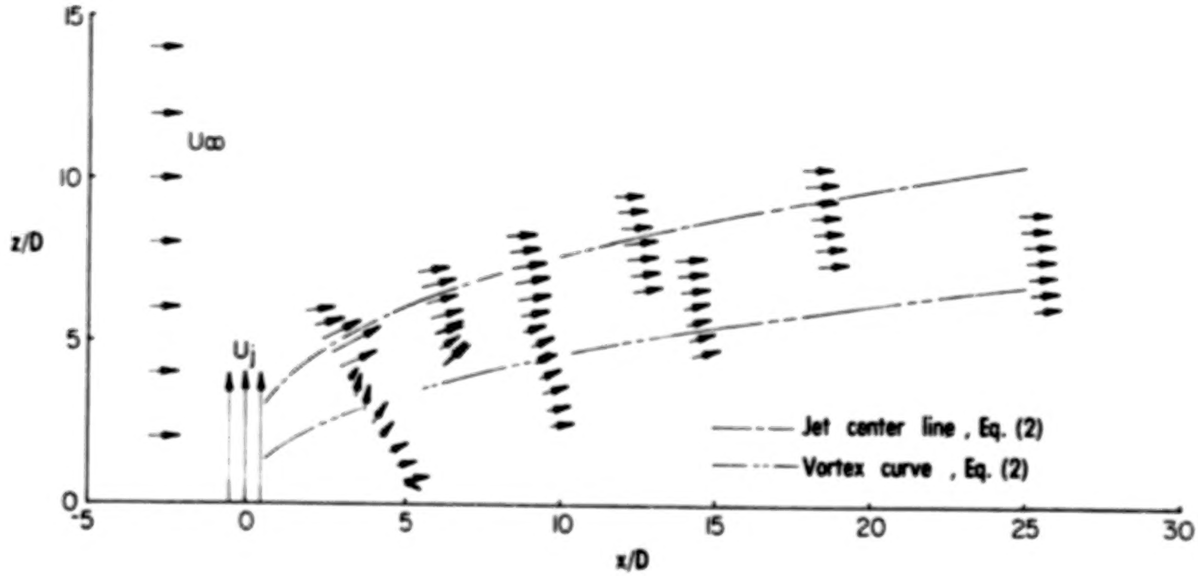
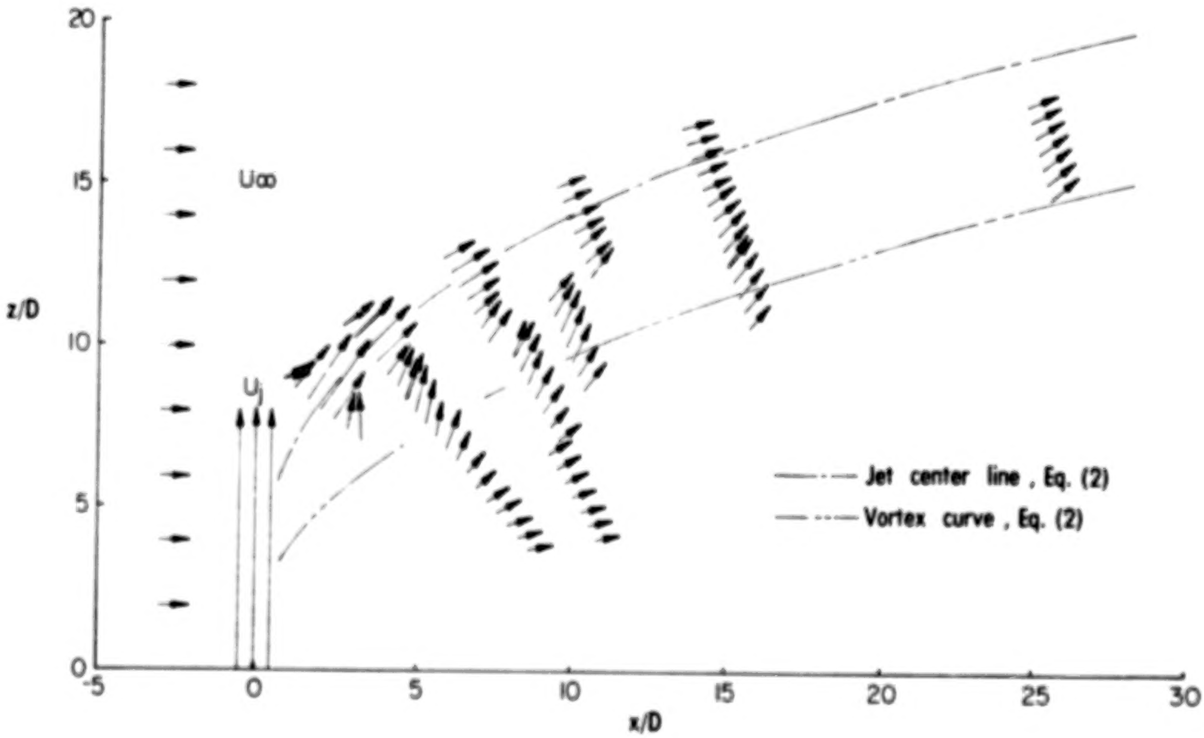


Figure 11.- Jet center line and vortex curve, comparison with other experiments.

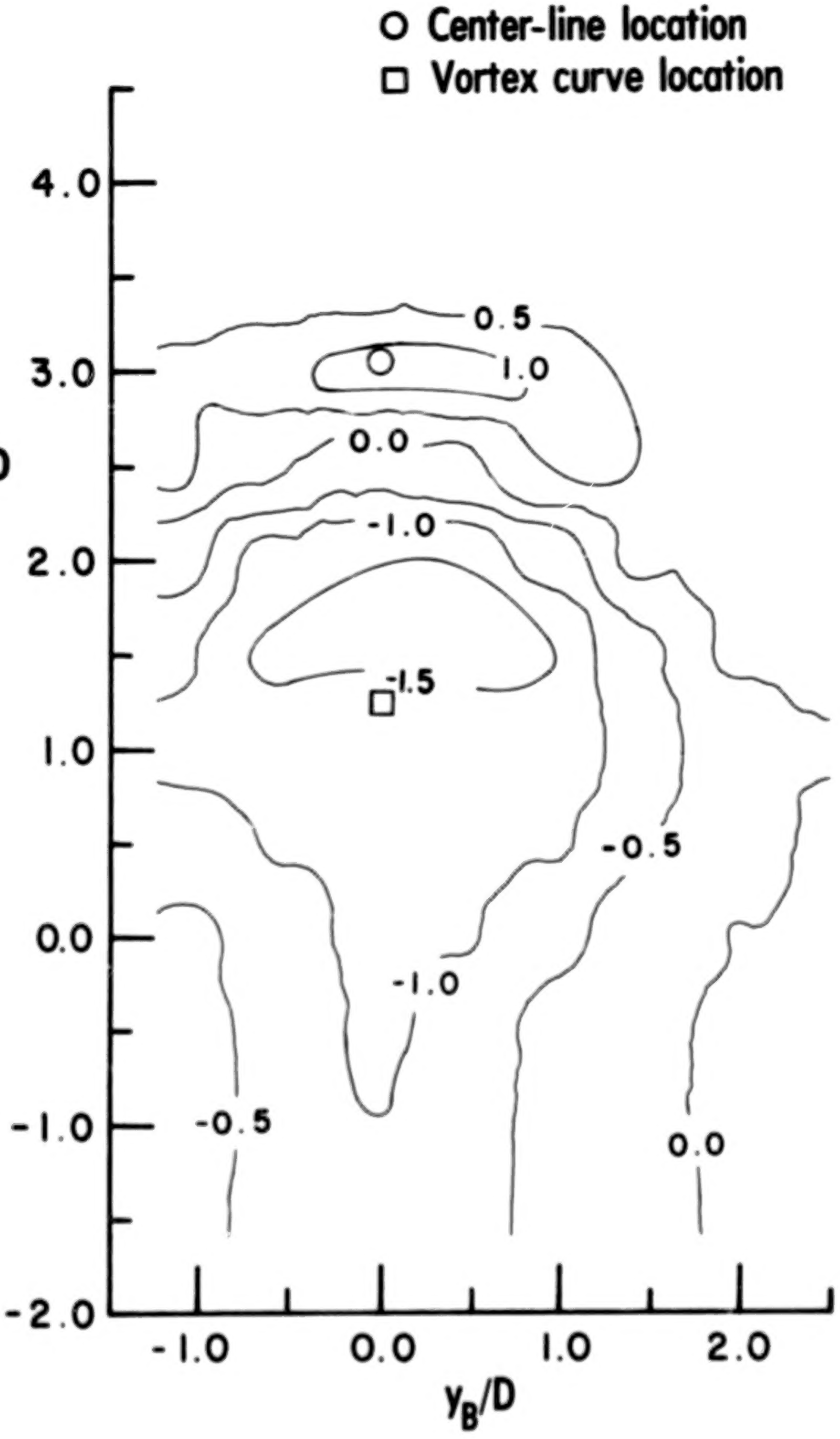


(a) R = 4.



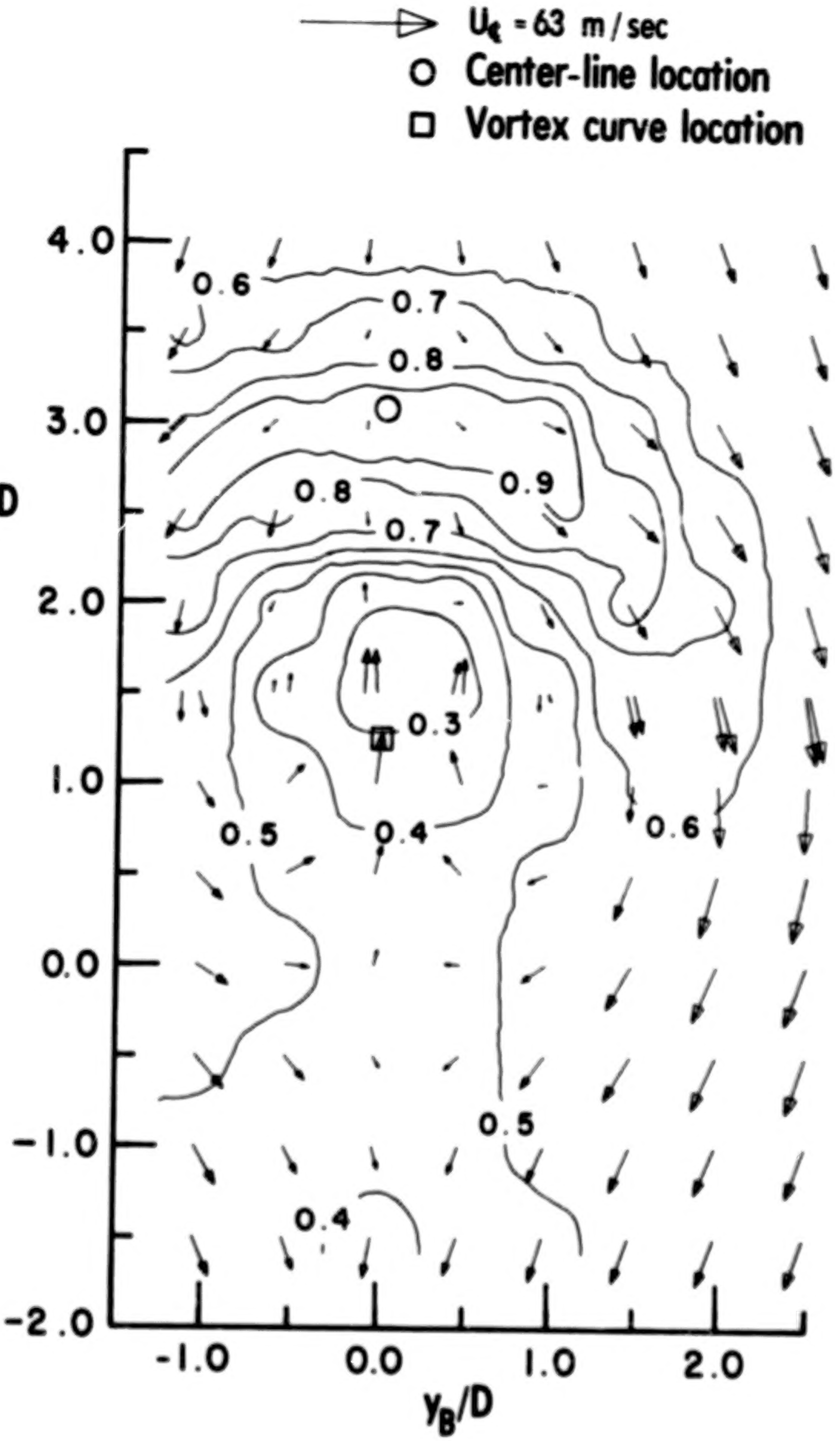
(b) R = 8.

Figure 12.- Symmetry plane velocities.



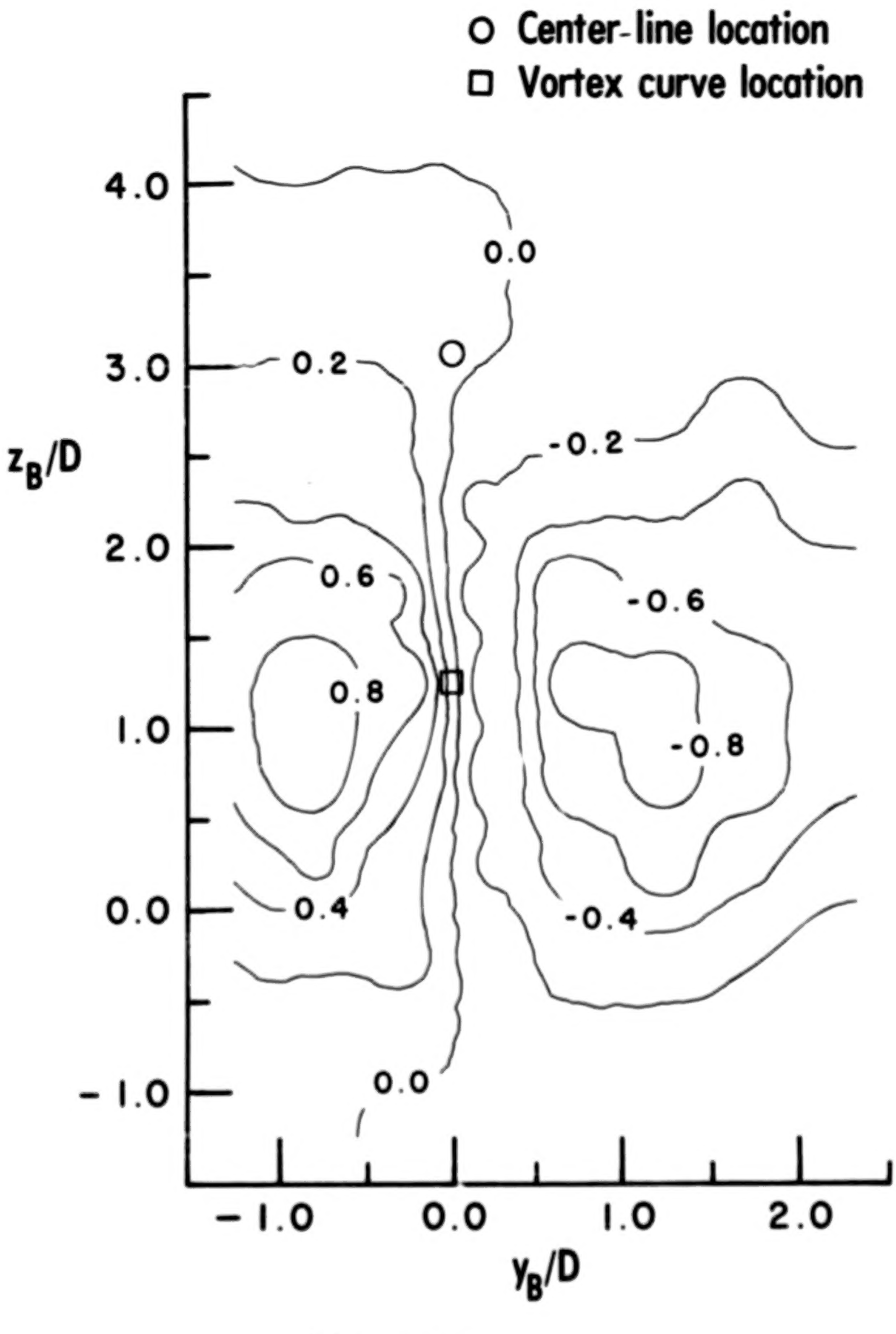
(a) Total-pressure coefficient $C_{p,t}$.

Figure 13.- Jet cross section for $R = 4.0$, $x/D = 4.16$, $z/D = 2.03$, and $\varphi_B = 32^{\circ}$.



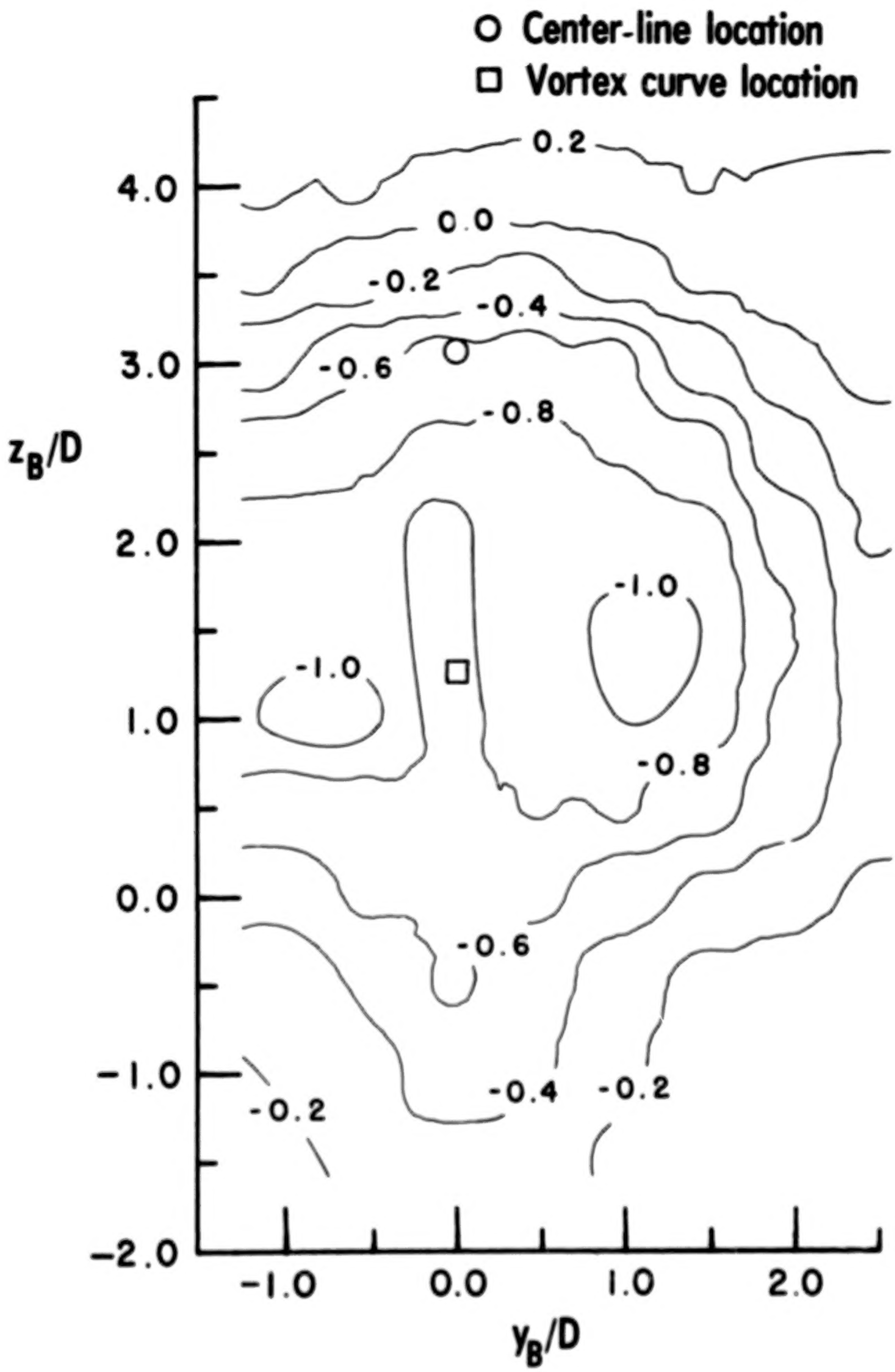
(b) Measured velocities, $U_B/U_{\mathfrak{t}}$ and $(\vec{V}_B + \vec{W}_B)/U_{\mathfrak{t}}$.

Figure 13.- Continued.



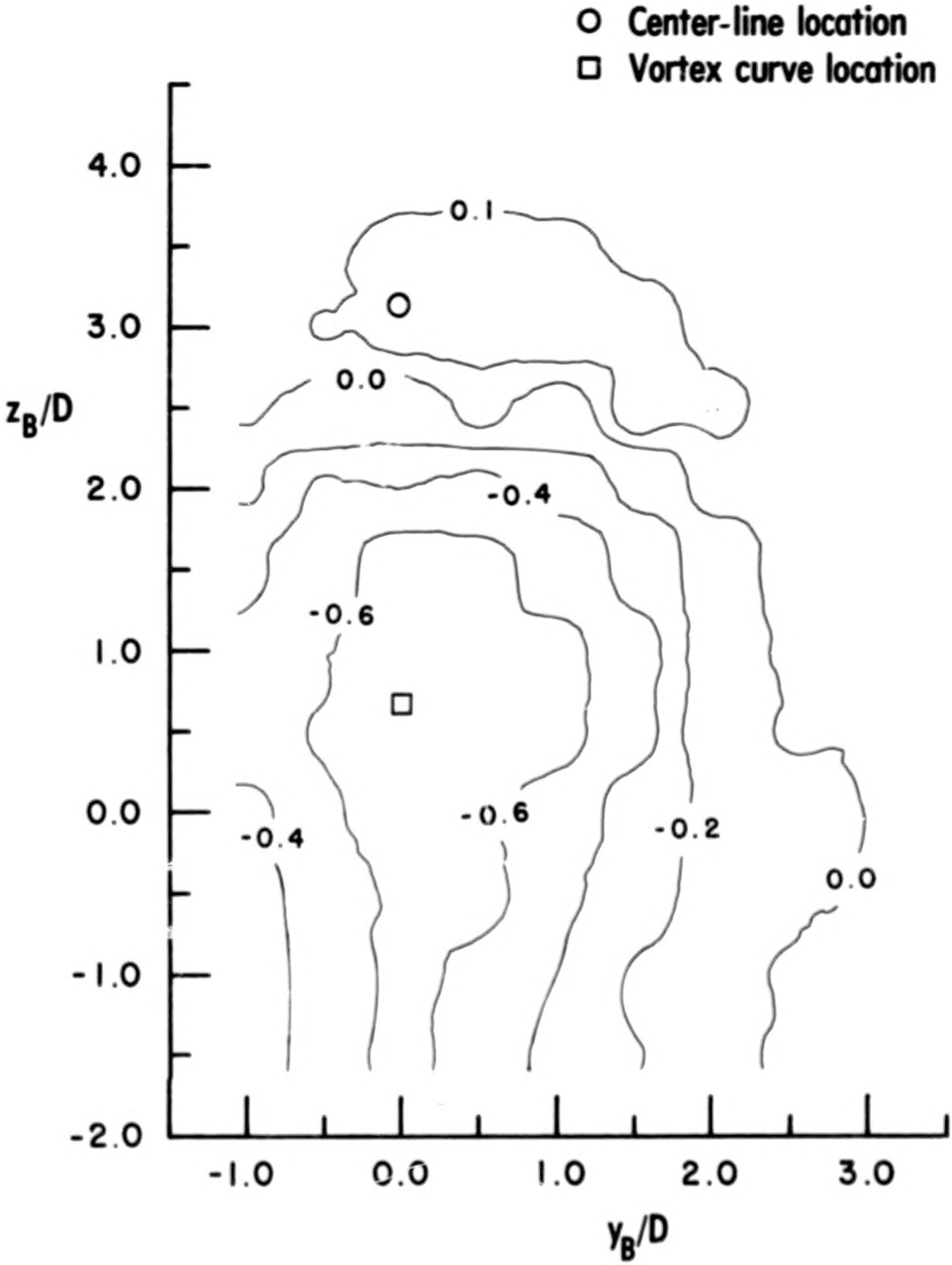
(c) Vorticity ω/ω_{max}.

Figure 13.- Continued.



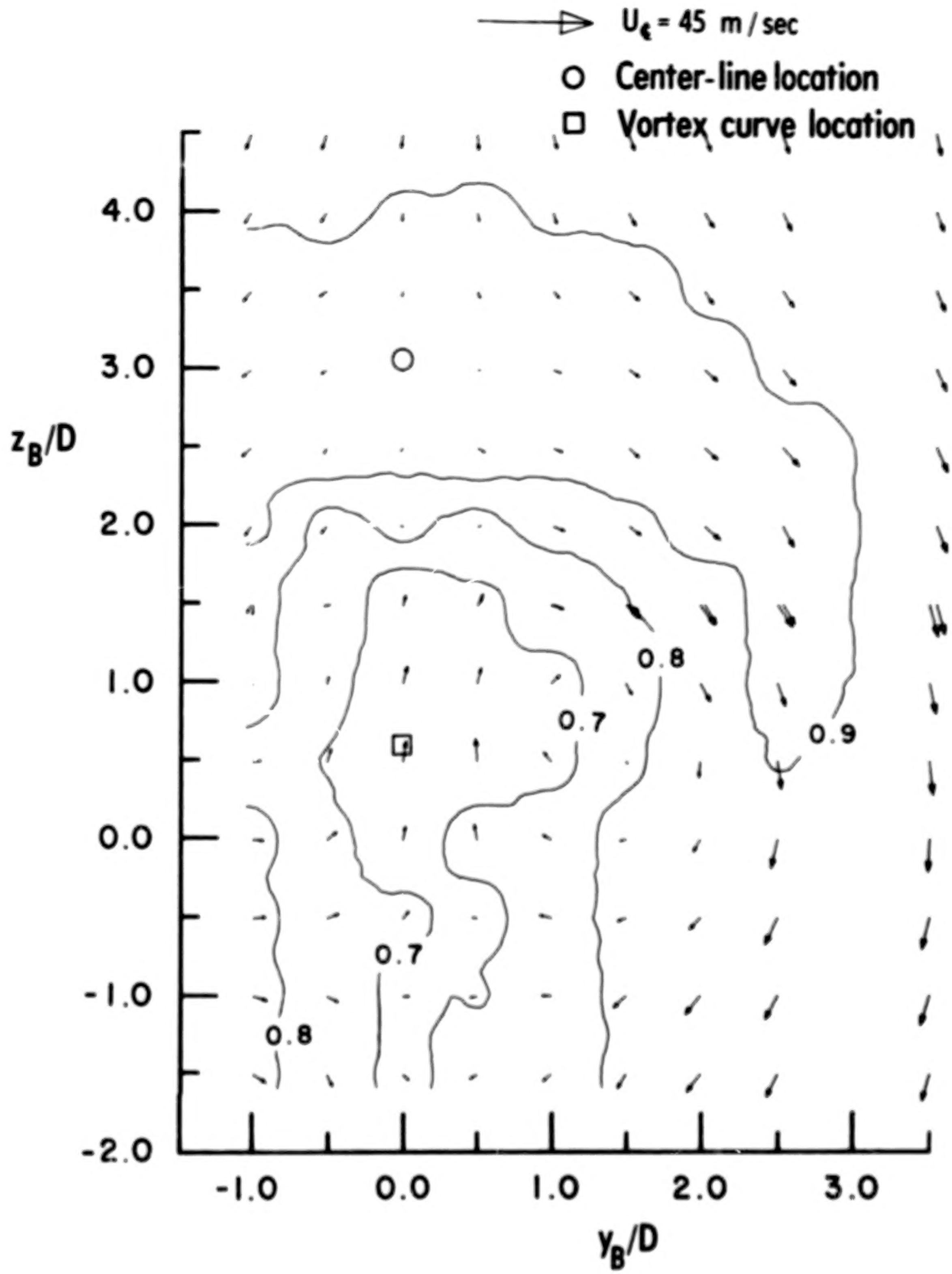
(d) Static-pressure coefficient C_p.

Figure 13.- Concluded.



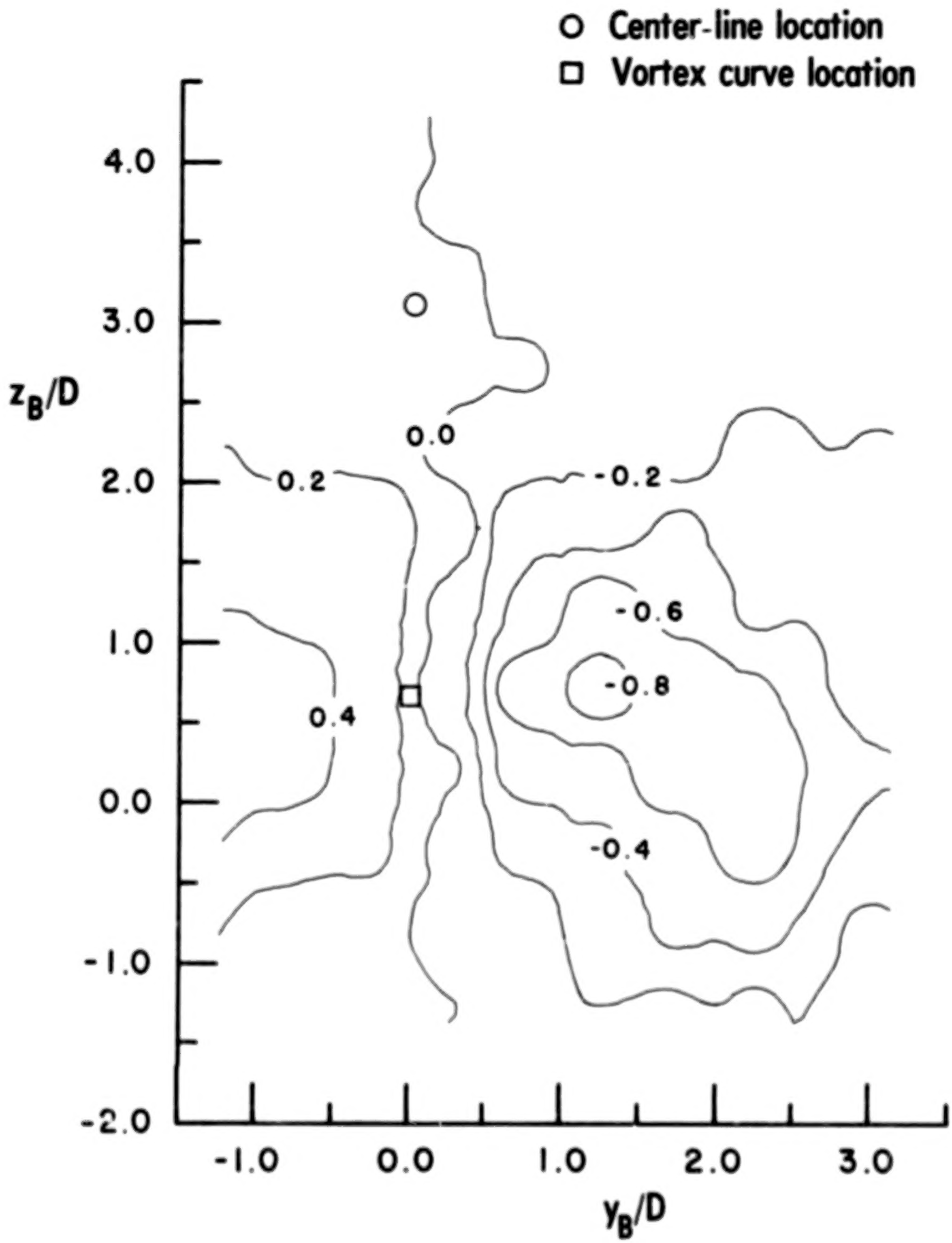
(a) Total-pressure coefficient $C_{p,t}$.

Figure 14.- Jet cross section for $R = 4.0$, $x/D = 9.22$, $z/D = 3.88$, and $\varphi_B = 15^{\circ}$.



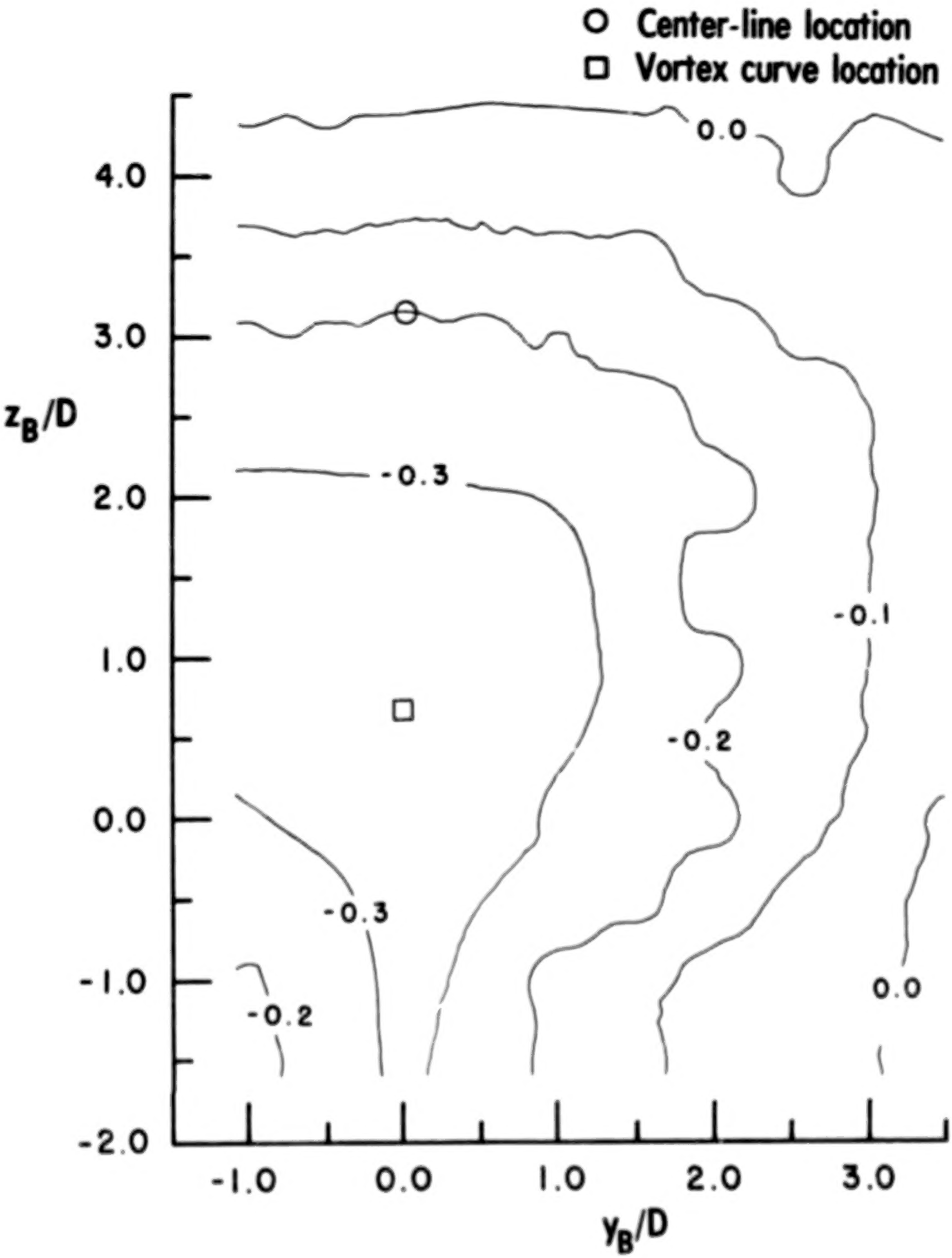
(b) Measured velocities, $U_B/U_{\mathrm{ȼ}}$ and $(\vec{V}_B + \vec{W}_B)/U_{\mathrm{ȼ}}$.

Figure 14.- Continued.



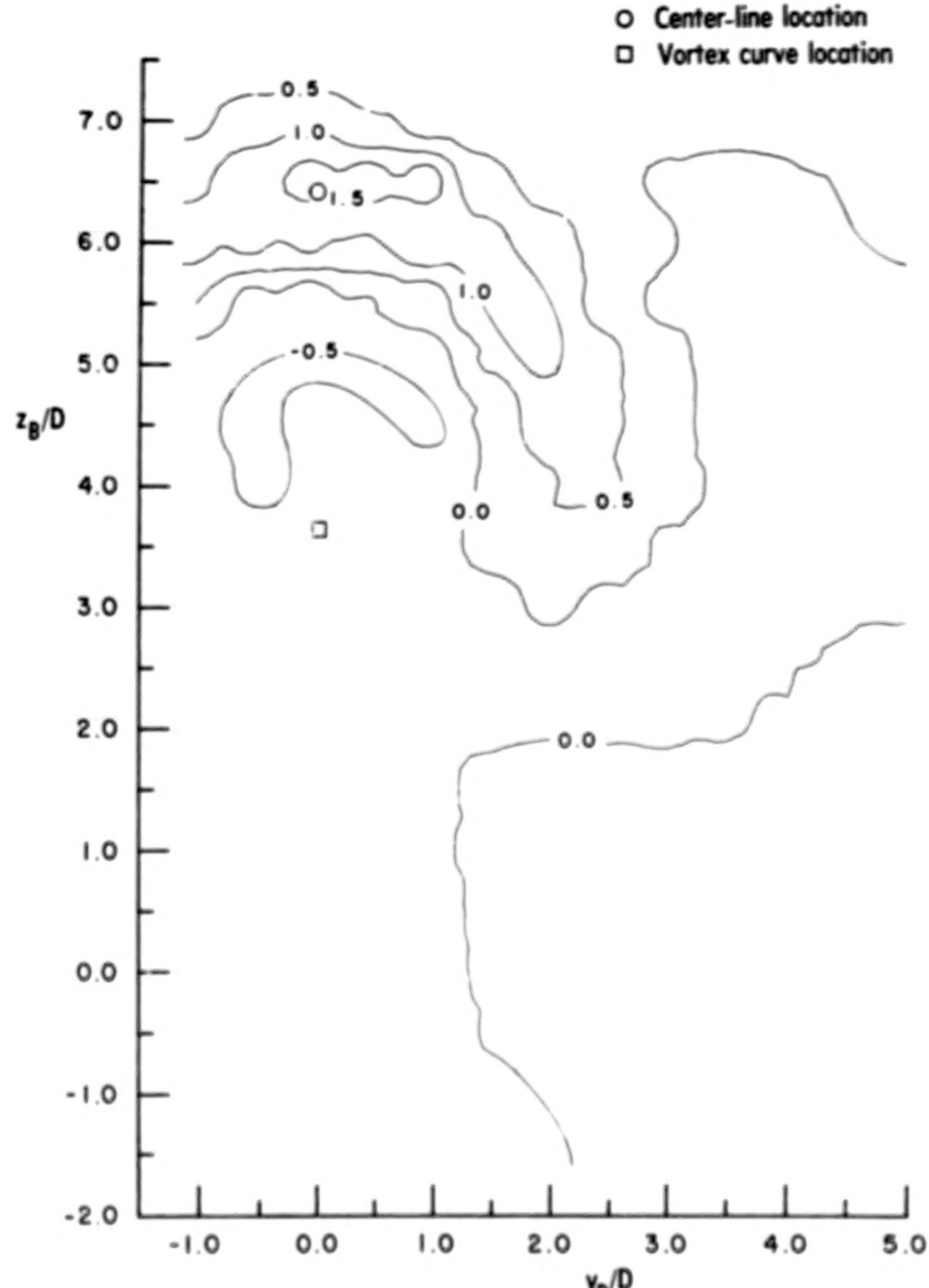
(c) Vorticity ω/ω_{max}.

Figure 14.- Continued.



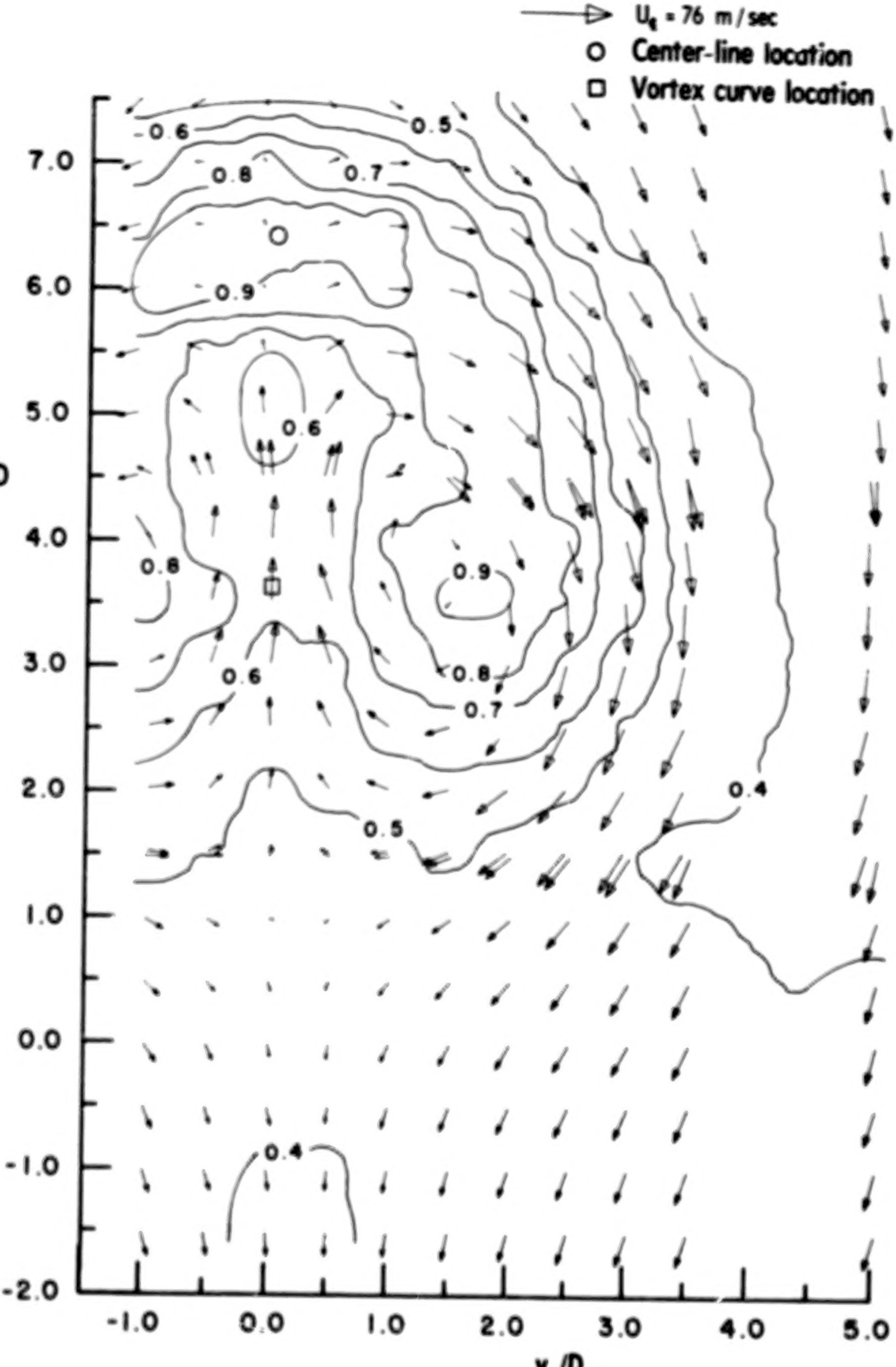
(d) Static-pressure coefficient C_p.

Figure 14.- Concluded.



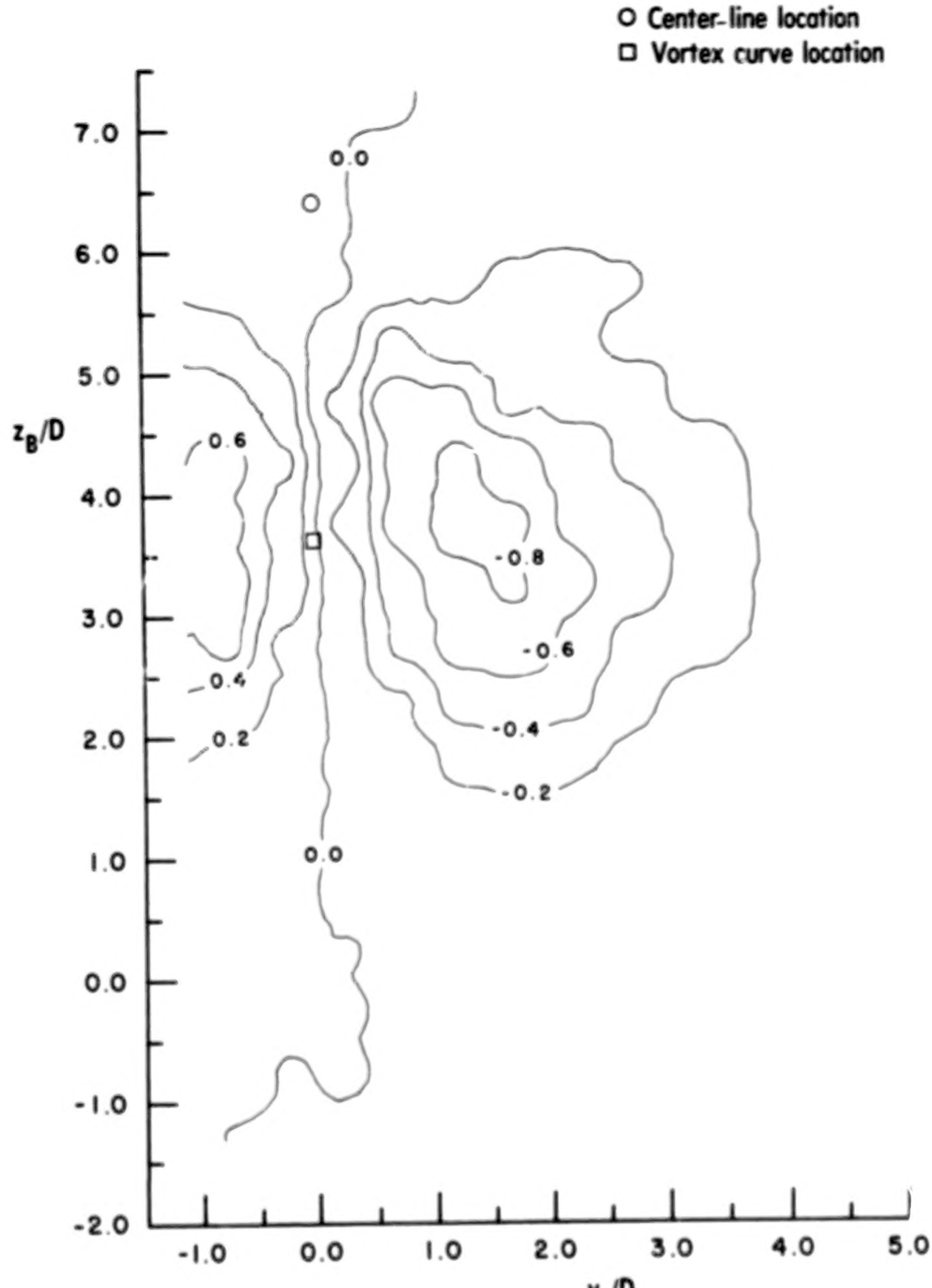
(a) Total-pressure coefficient $C_{p,t}$.

Figure 15.- Jet cross section for $R = 8.0$, $x/D = 7.60$, $z/D = 4.81$, and $\varphi_B = 42^{o}$.



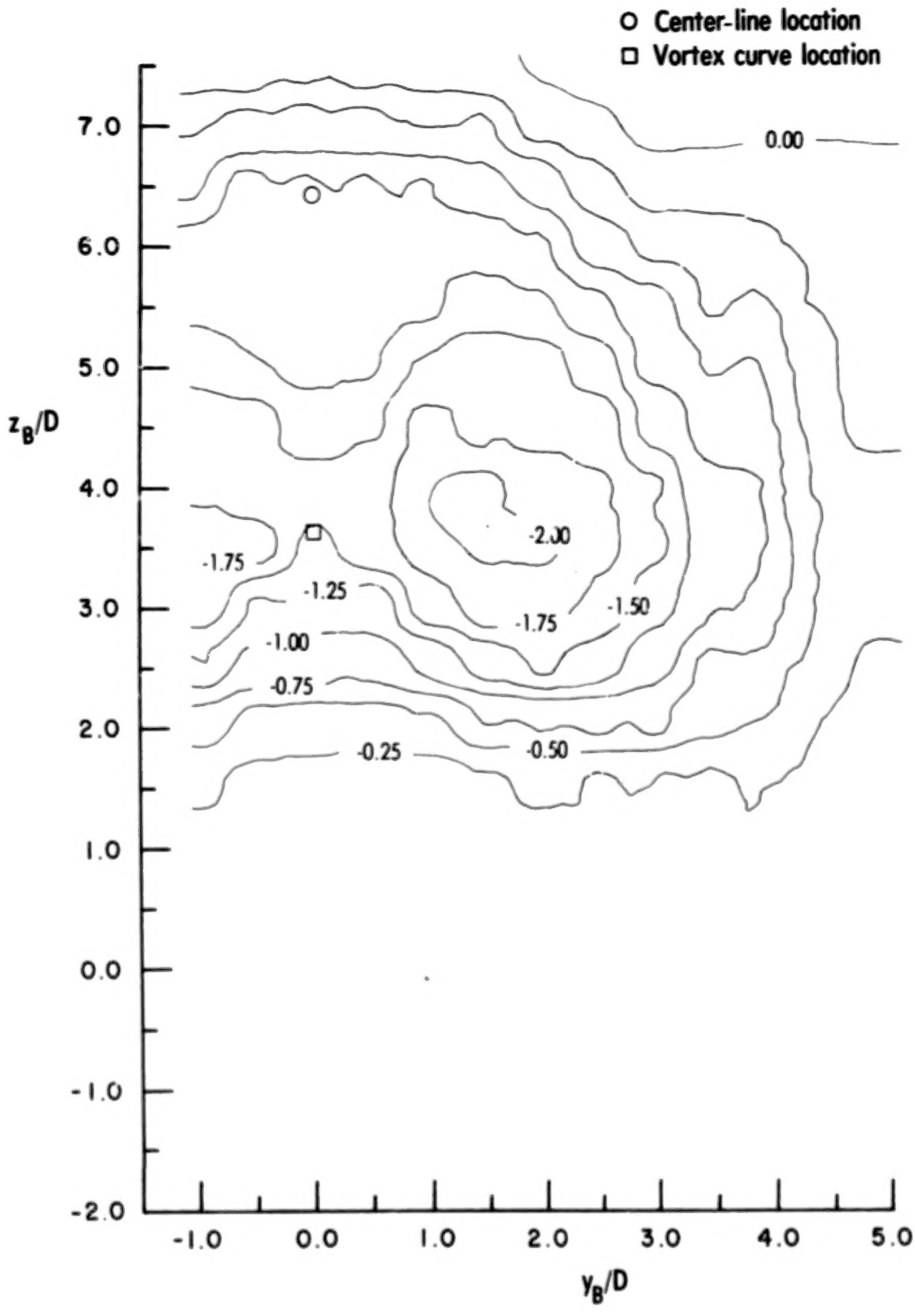
(b) Measured velocities, $U_B/U_{\mathfrak{t}}$ and $(\vec{V}_B + \vec{W}_B)/U_{\mathfrak{t}}$.

Figure 15.- Continued.



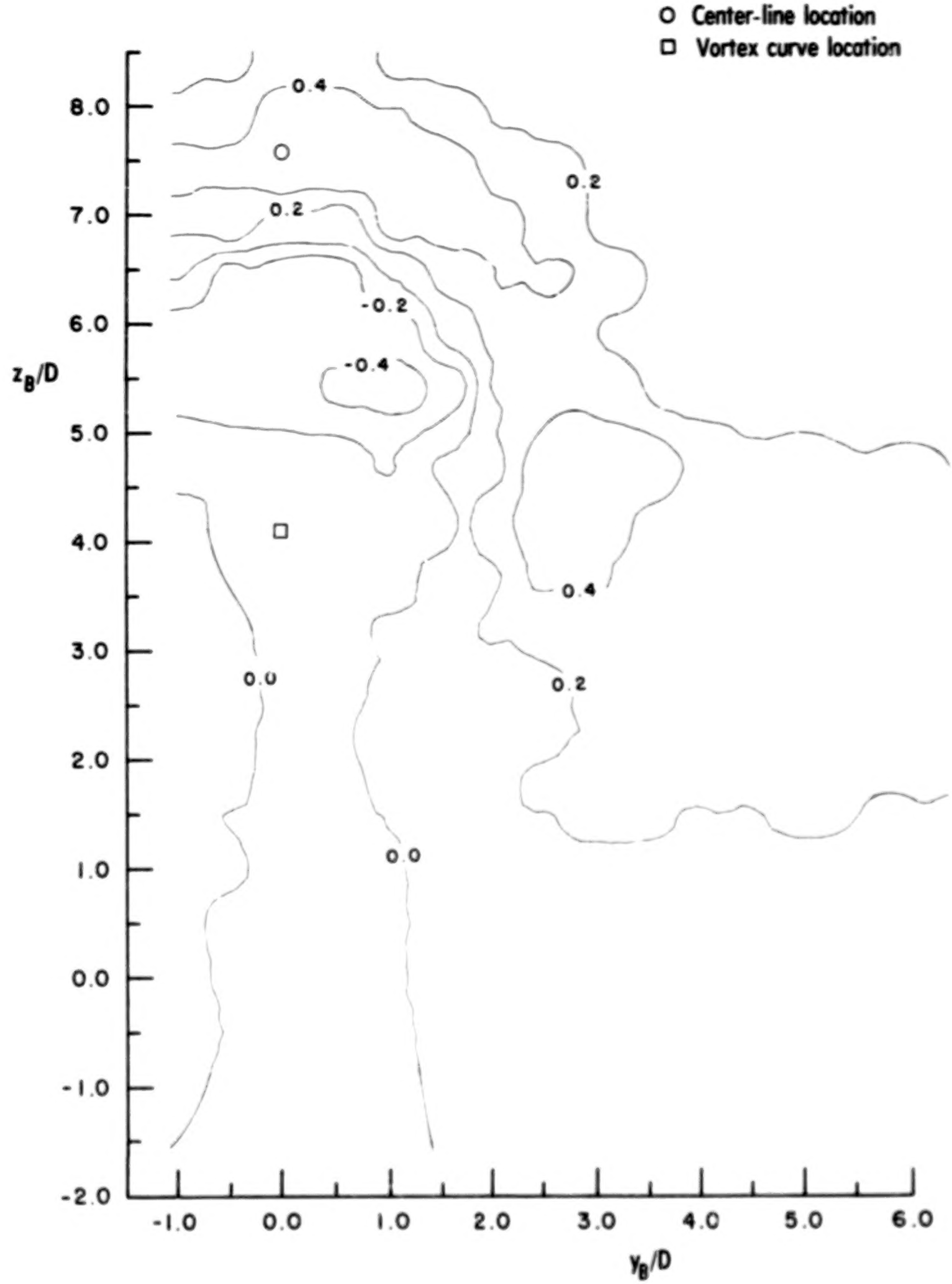
(c) Vorticity ω/ω_{max}.

Figure 15.- Continued.



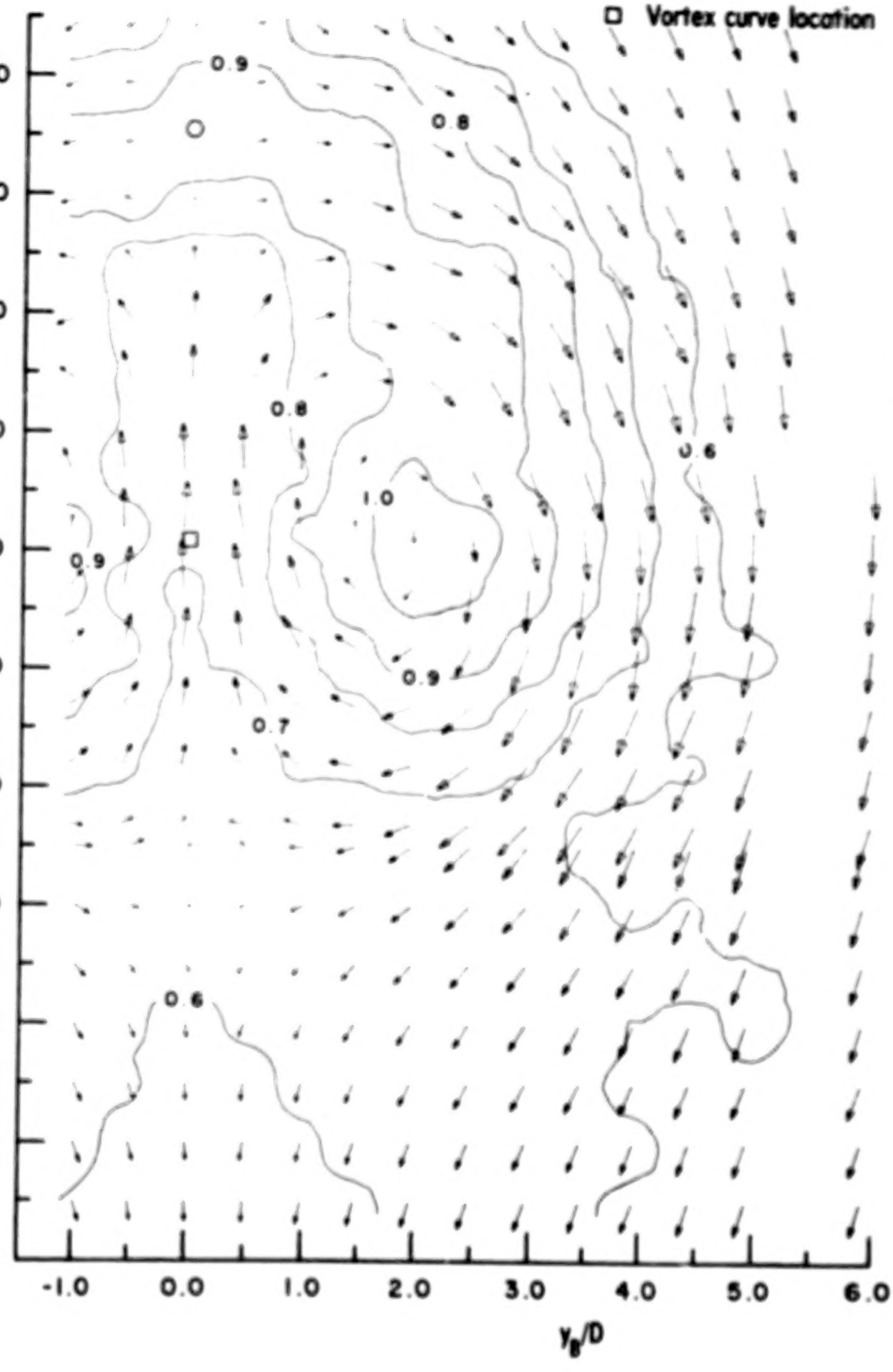
(d) Static-pressure coefficient C_p.

Figure 15.- Concluded.



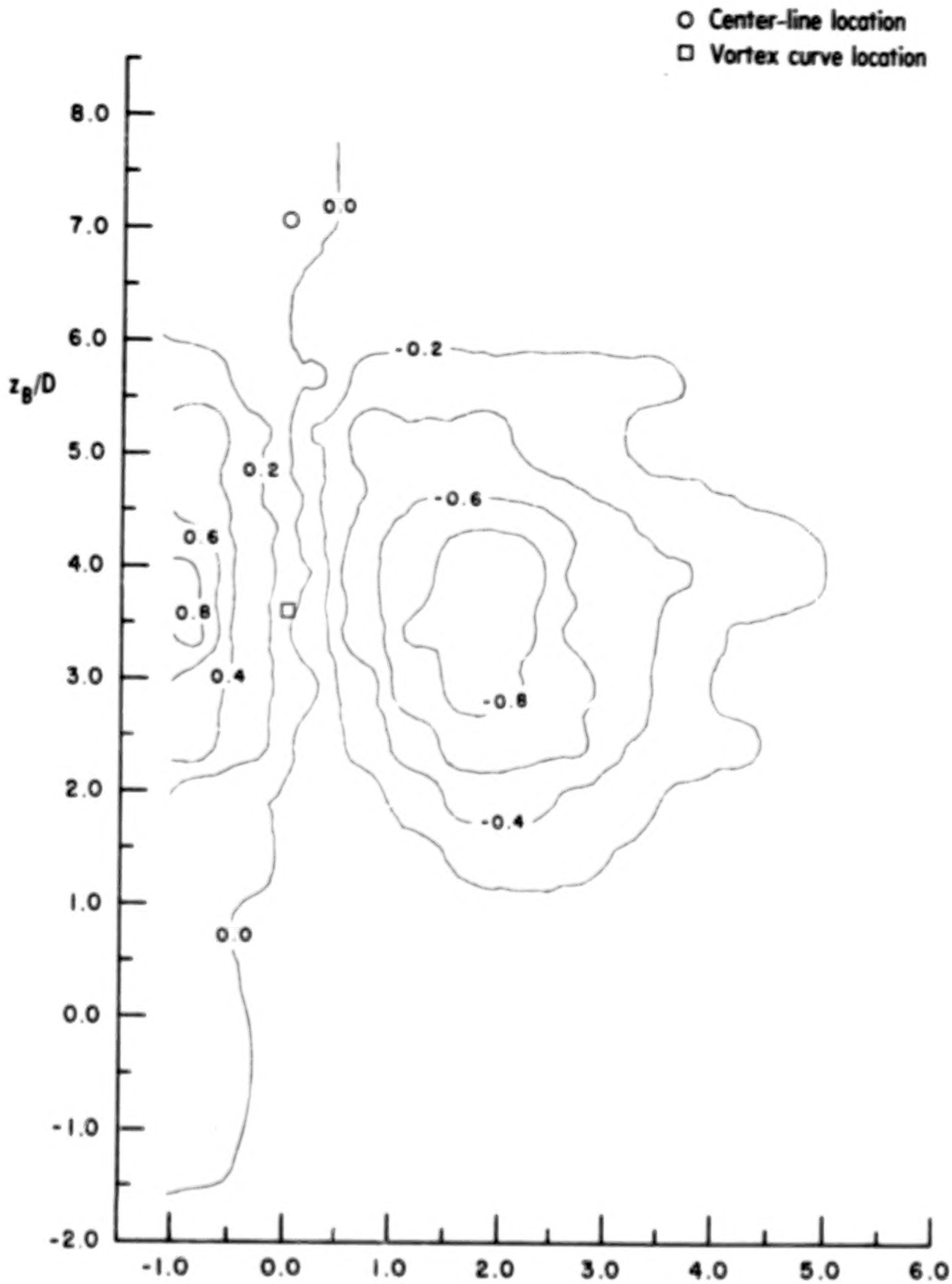
(a) Total-pressure coefficient $C_{p,t}$.

Figure 16.- Jet cross section for $R = 8.0$, $x/D = 10.00$, $z/D = 5.31$, and $\varphi_B = 30^\circ$.



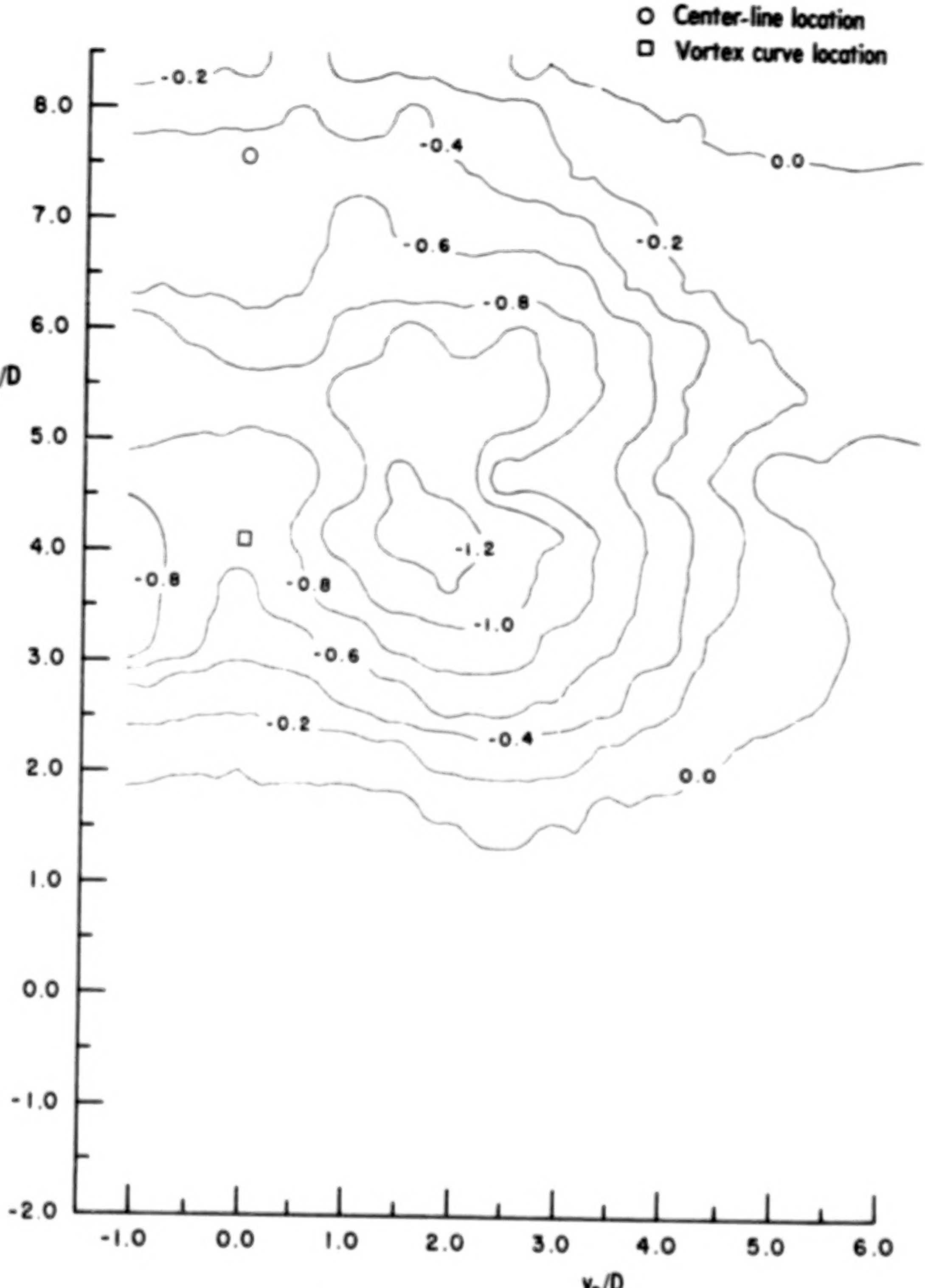
(b) Measured velocities, U_B/U_∞ and $(\vec{V}_B + \vec{W}_B)/U_\infty$.

Figure 16.- Continued.



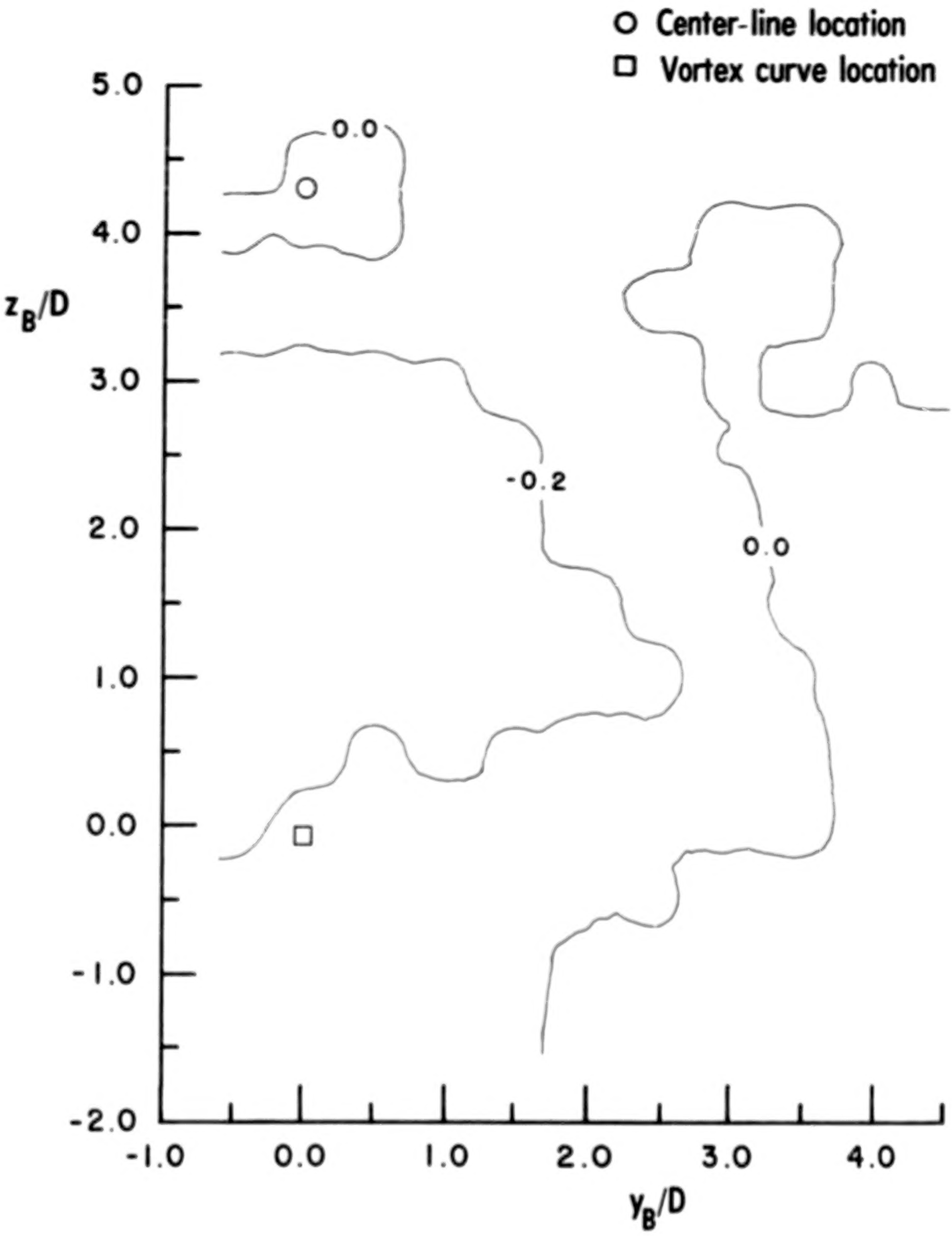
(c) Vorticity ω/ω_{max}.

Figure 16.- Continued.



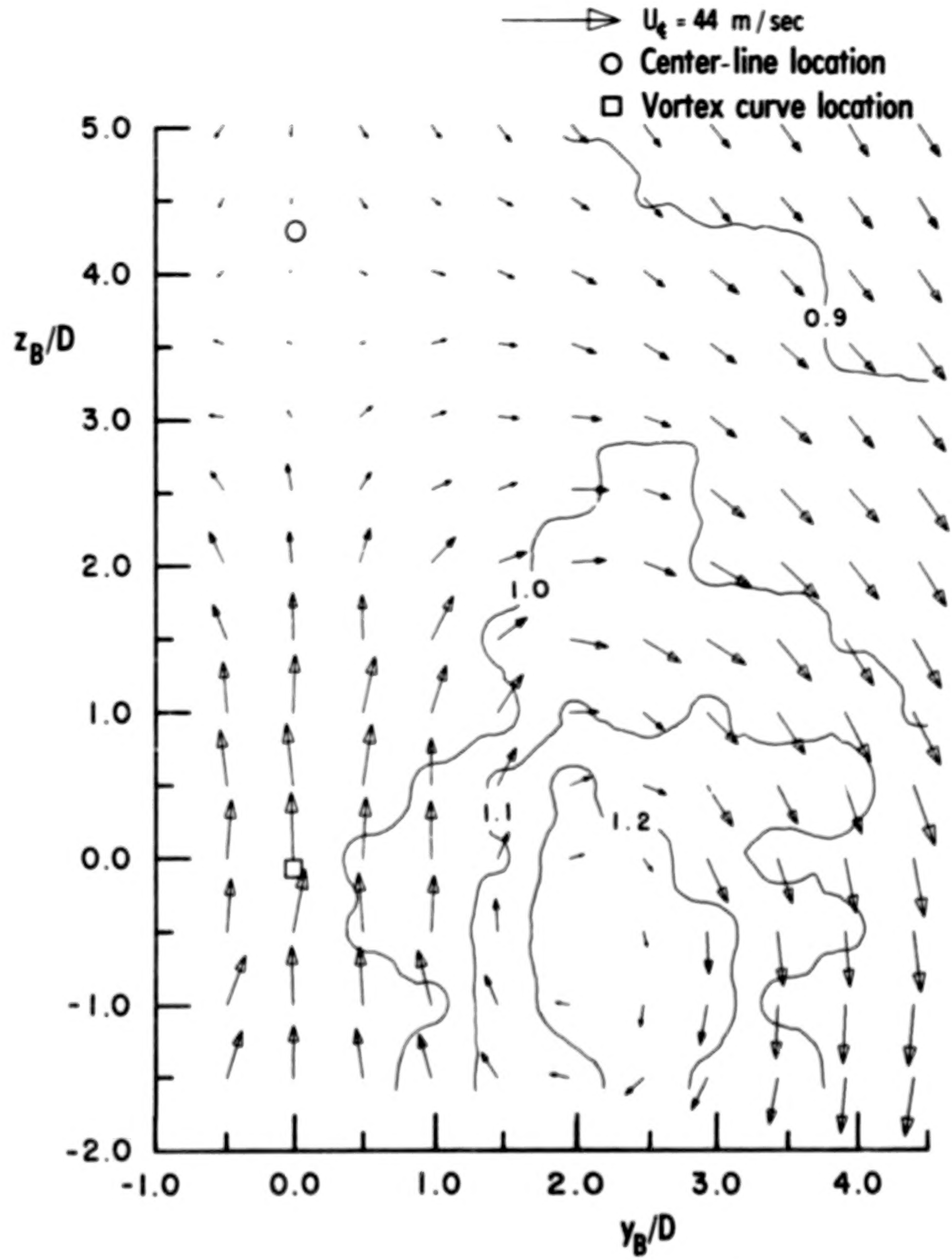
(d) Static-pressure coefficient C_p.

Figure 16.- Concluded.



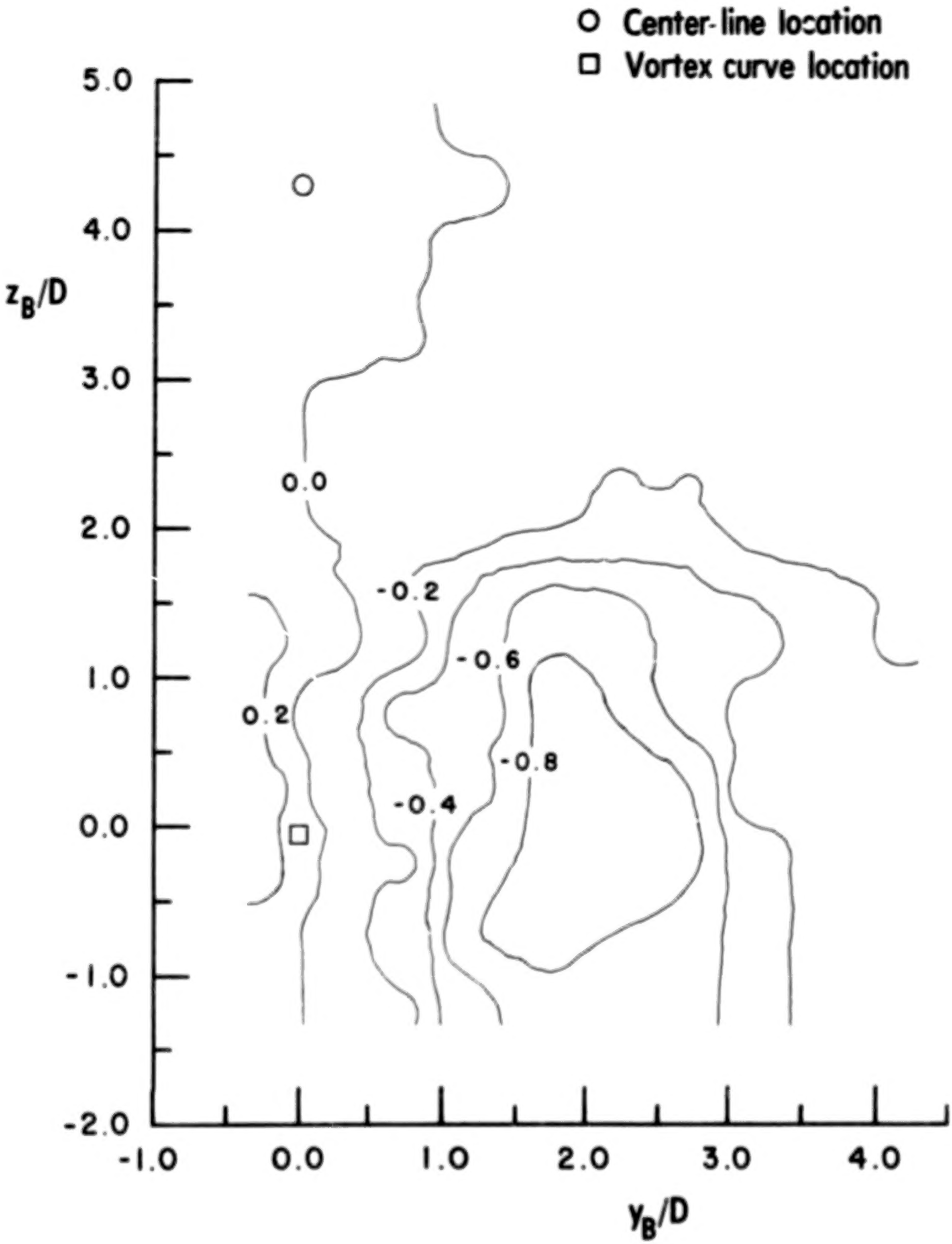
(a) Total-pressure coefficient $C_{p,t}$.

Figure 17.- Jet cross section for $R = 8.0$, $x/D = 15.18$, $z/D = 11.98$, and $\varphi_B = 20^{\circ}$.



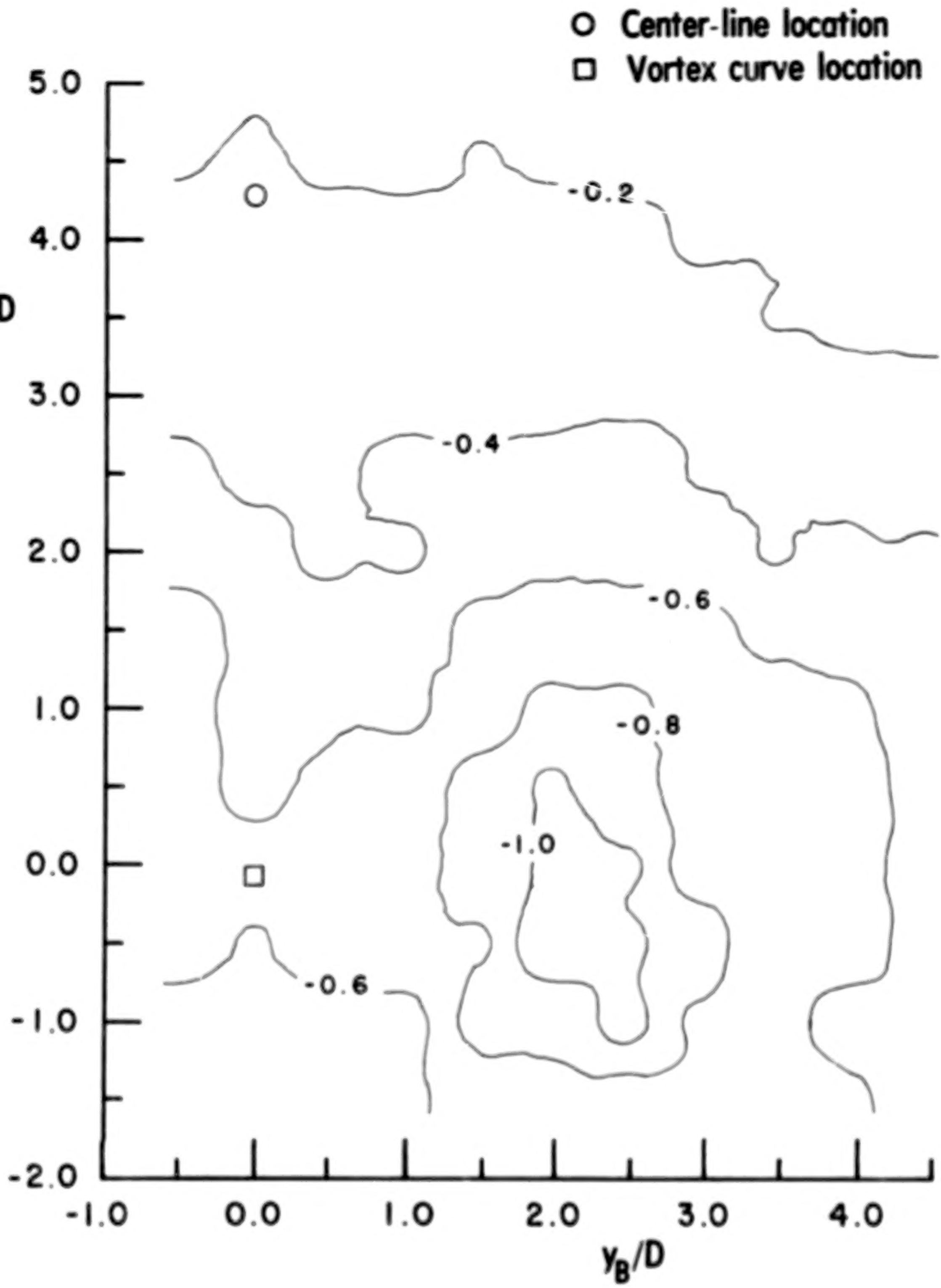
(b) Measured velocities, $U_B/U_{\mathfrak{C}}$ and $(\vec{V}_B + \vec{W}_B)/U_{\mathfrak{C}}$.

Figure 17.- Continued.



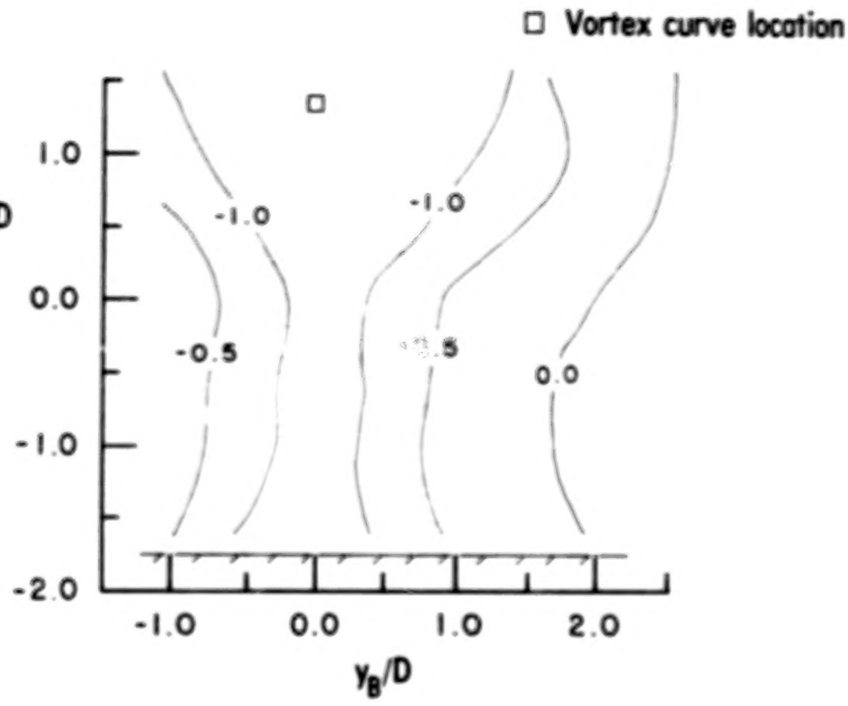
(c) Vorticity ω/ω_{max}.

Figure 17.- Continued.

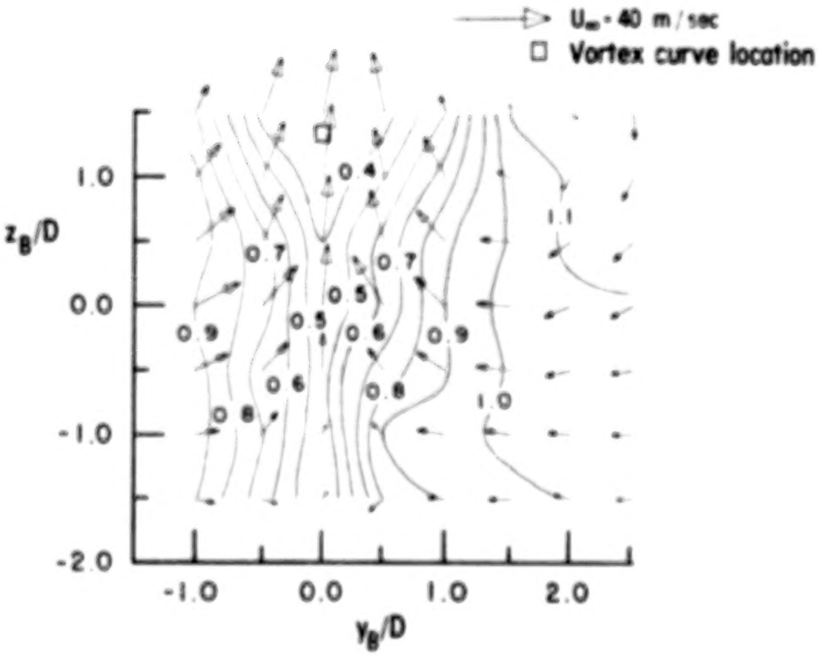


(d) Static-pressure coefficient C_p.

Figure 17.- Concluded.

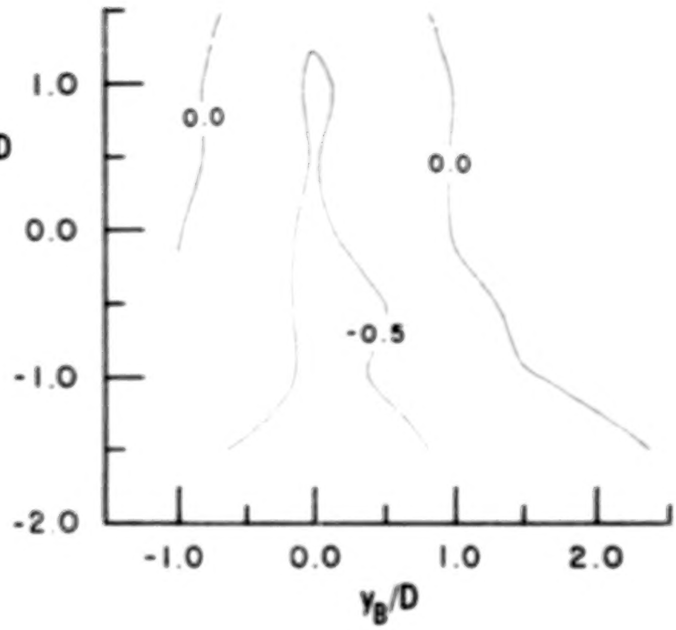


(a) Total-pressure coefficient $C_{p,t}$.

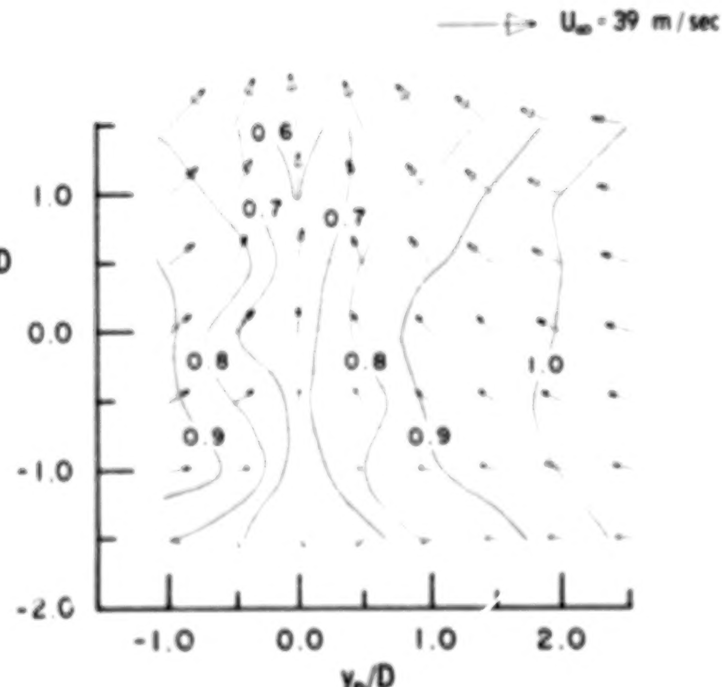


(b) Measured velocities, U_B/U_∞ and $(\vec{V}_B + \vec{W}_B)/U_\infty$.

Figure 18.- Vertical section for R = 4.0, x/D = 4.00, and z/D = 1.75.



(a) Total-pressure coefficient $C_{p,t}$.



(b) Measured velocities, U_B/U_∞ and $(\vec{V}_B + \vec{W}_B)/U_\infty$.

Figure 19.- Vertical section for R = 8.0, x/D = 4.00, z/D = 1.75.

APPENDIX A

CALIBRATION OF A YAW-PITCH PROBE

Thomas A. Trovillion, Jr.
University of Florida
Gainesville, Florida

The calibration of a yaw-pitch probe and the symbols used in calibration are presented in this appendix.

Symbols

Values are given both in SI Units and U.S. Customary Units. The measurements and calculations were made in U.S. Customary Units.

A, B, C, D, E, F — calibration constants defined by equations (A6), (A7), and (A8)

f_i — dimensionless pressure on port i defined as $(p_i - p_s)/Q$

p_i — pressure at port i, see figure A1, Pa (lb/ft^2)

p_s — static pressure of flow, Pa (lb/ft^2)

q — dynamic pressure of flow, Pa (lb/ft^2)

q_p — quantity defined by equation (A2), Pa (lb/ft^2)

V — velocity of flow at surface of sphere, m/sec (ft/sec)

U_∞ — free-stream velocity of flow, m/sec (ft/sec)

α — pitch angle of total-pressure port to stagnation point, deg

α_o — pitch angle of sting when Δp_α equals zero, deg

α^* — pitch angle of tunnel flow, deg

α_e — difference in pitch between calculated angle and tunnel sting setting; superscripted to denote probe pitch or yaw calibration data set (e.g., $\alpha_e{}^\alpha$ or $\alpha_e{}^\beta$), deg

β — yaw angle of total-pressure port to stagnation point, deg

β_o yaw angle of sting when Δp_β equals zero, deg

β^* yaw angle of tunnel flow, deg

β_e difference in yaw between calculated angle and tunnel sting setting; superscripted to denote probe pitch or yaw calibration data set (e.g., β_e^α or β_e^β), deg

Δp_α difference in pressure between pitch ports, Pa (lb/ft^2)

Δp_β difference in pressure between yaw ports, Pa (lb/ft^2)

θ total angle of total port to stagnation point, deg

θ_o total angle where q_p becomes zero, singularity of equation (A5), deg

θ_i angle between ith port and stagnation point, deg

ρ density, kg/m^3 (slug/ft^3)

ψ roll angle at total pressure port from lower α port to stagnation point, deg

ψ_o fixed roll-angle error between probe calculation and sting, deg

Calibration Scheme

Probe description.- The probe to be calibrated is a yaw-pitch probe with a total-pressure port at the forward point of a hemispherical tip and a ring of six interconnected static ports approximately eight probe diameters from the tip. To measure the angle of the velocity vector, four ports are placed at approximately 45° to the total-pressure port in the directions of yaw and pitch. The total-pressure port and static-pressure port are numbered ports 1 and 2, respectively. When the probe is lined up with the local velocity vector, the difference between these pressures gives the standard incompressible measurement of the dynamic pressure. When looking upwind, the right and left ports are called the beta ports and are labeled 3 and 4, respectively. These will give the angle of yaw, which is the angle β. The top and bottom ports are called the alpha ports and are labeled 5 and 6, respectively. These will give the angle of pitch, which is the angle α.

Coordinate system.- To specify the orientation of the velocity vector with respect to the probe, the usual coordinates used are the Euler angles α and β, as shown in figure A1. For a complete solution of the calibration problem to large angles, it is more convenient to use the angles θ and ψ. Since the pressures on the hemispherical tip are assumed to be symmetrical about the stagnation point, the significant angle is the total angle θ the probe makes with the velocity vector. To specify the direction of the velocity vector relative to the probe, a polar angle ψ is taken about the probe and referenced to the

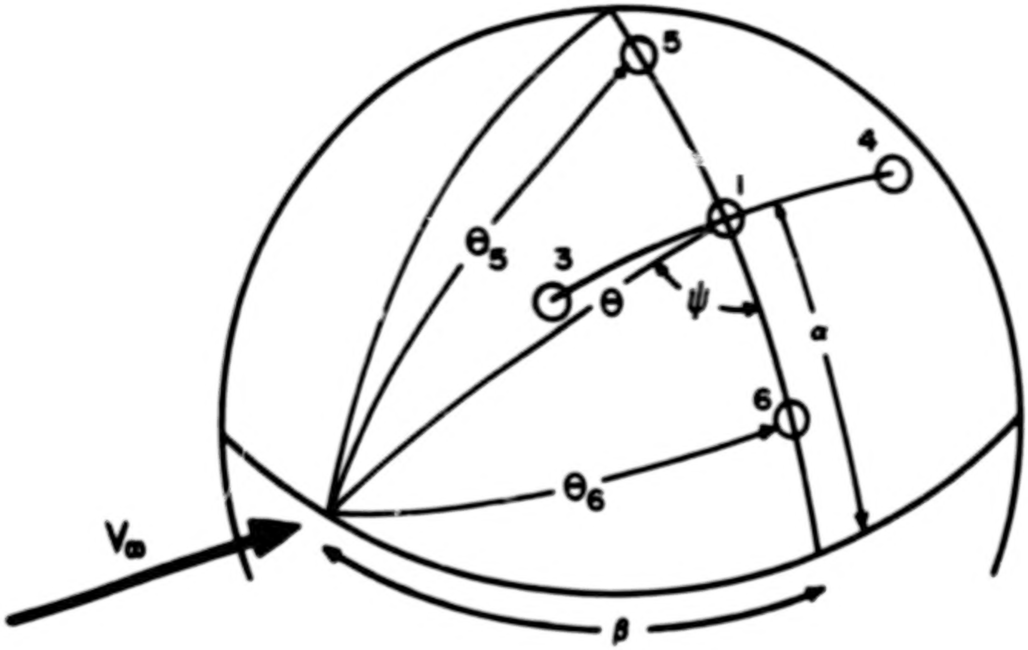


Figure A1.- Probe coordinate system.

lower alpha port. Spherical trigonometry gives the following conversion between the two coordinate systems:

$$\tan \alpha = \tan \theta \cos \psi$$

$$\sin \beta = \sin \theta \sin \psi$$

Calibration based on potential flow over a sphere.- The pressure on a sphere is a function only of the total angle θ from the stagnation point. A nondimensional quantity f_i may be defined as the pressure p_i on port i minus the static pressure p_s, divided by the dynamic pressure q

$$f_i(\theta_i) = \frac{p_i - p_s}{q}$$

This quantity can be determined theoretically by using the potential flow theory for uniform flow over a sphere. If axisymmetric flow is assumed, the superposition of a free stream and a doublet flow gives the velocity on the surface of the sphere as

$$V(\theta) = \frac{3}{2} U_\infty \sin \theta$$

Bernoulli's equation is then used to obtain the pressure distribution on the sphere

$$p_i + \frac{1}{2}\rho V^2 = p_s + \frac{1}{2}\rho U_\infty^{\,2}$$

By using this equation and the definition of f_i, one obtains

$$f_i(\theta_i) = \frac{9}{4}\cos^2\theta_i - \frac{5}{4}$$

The most important quantities are the differences in pressure between the two alpha ports and the two beta ports. These are labeled Δp_α and Δp_β, respectively, with the convention that they are positive in the α- and β-directions. From the definition of f_i, the following relations are obtained:

$$\Delta p_\alpha = q(f_6 - f_5)$$

$$\Delta p_\beta = q(f_3 - f_4)$$

By using the functional form of f_i one obtains the relations:

$$\Delta p_\alpha = \frac{9}{4} q(\cos^2\theta_6 - \cos^2\theta_5)$$

$$\Delta p_\beta = \frac{9}{4} q(\cos^2\theta_3 - \cos^2\theta_4)$$

These relations can be converted to functions of θ and ψ by reference to figure A1. The law of cosines for spherical triangles gives

$$\cos\theta_6 = \cos\theta\cos 45^\circ + \sin\theta\sin 45^\circ\cos\psi$$

$$\cos\theta_5 = \cos\theta\cos 45^\circ - \sin\theta\sin 45^\circ\cos\psi$$

$$\cos\theta_4 = \cos\theta\cos 45^\circ - \sin\theta\sin 45^\circ\sin\psi$$

$$\cos\theta_3 = \cos\theta\cos 45^\circ + \sin\theta\sin 45^\circ\sin\psi$$

By substituting these equations into the equations for Δp_α and Δp_β, one obtains

$$\Delta p_\alpha = \frac{9}{4} q \sin 2\theta\cos\psi$$

$$\Delta p_\beta = \frac{9}{4} q \sin 2\theta\sin\psi$$

The dependence on θ and ψ can be separated by taking the ratio and the square root of the sum of the squares of these two equations

$$\left.\begin{aligned} \frac{\Delta p_\beta}{\Delta p_\alpha} &= \tan \psi \\ \left(\Delta p_\alpha{}^2 + \Delta p_\beta{}^2\right)^{1/2} &= \frac{9}{4} q \sin 2\theta \end{aligned}\right\} \tag{A1}$$

The square-root quantity may be nondimensionalized by dividing by the quantity q_p, defined as the pressure on port 1 minus the average of the pressures on the four angle ports. This relation can be written in terms of the f_i as

$$q_p = q\left[f_1 - \frac{1}{4}(f_3 + f_4 + f_5 + f_6)\right] \tag{A2}$$

By using the [illegible]etical pressure distribution, equation (A2) reduces to

$$q_p = q\left(\frac{27}{32} \cos 2\theta + \frac{9}{32}\right) \tag{A3}$$

The square-root quantity then becomes

$$\frac{\left(\Delta p_\alpha{}^2 + \Delta p_\beta{}^2\right)^{1/2}}{q_p} = \frac{\frac{9}{4} \sin 2\theta}{\frac{27}{32} \cos 2\theta + \frac{9}{32}} \tag{A4}$$

It should be noted that this has a singularity at 54.7°. The scheme given here does not use the measurements made on the static-pressure ports which can be greatly in error at large angles to the velocity. But the static pressure can be calculated from the quantity f_1 once the dynamic pressure q and the total angle θ are known, by using the following formula:

$$p_1 - p_s = q\left(\frac{9}{4} \cos^2 \theta - \frac{5}{4}\right) \tag{A5}$$

Equations (A1), (A3), (A4), and (A5) determine the primary quantities from which the angles θ and ψ, and the pressures q and p_s can be found.

Generalization of calibration scheme.- For a number of reasons the potential flow calibration may not be satisfactory for a given yaw-pitch probe. The decrease in pressures with θ given by the potential flow theory is only the ideal, and so differs from experimental values at large distances from the stagnation point. The placement of the ports may also be in error, which means there will be fixed errors in the α- and β-directions, in the rotation angle ψ, and in the sums and differences of the pressures on the alpha and beta ports. For these reasons the theoretical calibration is generalized to include some experimentally determined parameters. While maintaining the same form, the constants of the θ dependence are made arbitrary so that equations (A3), (A4), and (A5) are generalized to

$$\frac{\left(\Delta p_\alpha{}^2 + \Delta p_\beta{}^2\right)^{1/2}}{q_p} = A\,\frac{\sin 2\theta}{\cos 2\theta - \cos 2\theta_o} \tag{A6}$$

$$q_p = q\left[B(\cos 2\theta - \cos 2\theta_o) + C(\cos \theta - \cos \theta_o)\right] \tag{A7}$$

$$p_1 - p_s = q(D \cos 2\theta + E \cos \theta + F) \tag{A8}$$

The calculation for ψ is kept the same. The constant θ_o is the singularity point of equation (A6) and must be the same for equation (A7) to determine correct values for q.

Determination of the Calibration Constants

The calibration scheme described has been used with good results to calibrate a rake of seven yaw-pitch probes. Two sets of calibration data were available for these probes. One set was taken entirely in the pitch direction and the other in the yaw direction. Each set had both positive and negative values to angles of 65° with 5° increments between values. Each set of data was then used to determine a set of calibration constants. The experimental data were reduced by calculating the angles and pressures by each set of constants and averaging them on the basis of the calculated value of ψ according to the following formula:

$$\text{Average parameter} = (\alpha \text{ value}) \cos^2 \psi + (\beta \text{ value}) \sin^2 \psi$$

The calibration constants can be determined from the data in various ways. The method presented here determines the calibration constants in such a manner that the calibration scheme provides a best fit to the calibration data in a least-squares sense. By using an initial guess of A, θ_o, and ψ_o with equations (A1) and (A6), values of θ and ψ are obtained from which α and β are determined for each point of the data set. The pitch and yaw angles at which the probe is set with respect to the tunnel are known. The difference between these two coordinate systems is just the pitch and yaw angles α_* and β_*, and includes the probe angle errors and the flow angularity of the tunnel. As long as all the calibration data are taken at the same point in the tunnel and the probes are not rotated on the sting (a condition which was true for each set of the data separately), the values of α_* and β_* should be constant for all points in the data set. The initial guess for the constants A, θ_o, and ψ_o are varied incrementally to determine the values that give the most nearly constant α_* and β_* in the least-squares sense over the entire data set.

The α_* and β_* are then used to determine the values of the probe errors (α_o,β_o) and also the tunnel flow angularity (α^*,β^*). Since it is desired to know the lower angles more closely than the high angles, the α_* and β_* values for the data points with total angles less than 12° are averaged to obtain the values used and these are superscripted to reference the data set they are derived from. How the probe errors are separated from these values depends on how the data sets were obtained. The present calibration data were taken by varying the yaw angles and then rotating the probe 90° and varying the same tun-

nel referenced angles to obtain the set of pitch data. The α_o and β_o values are then determined as follows:

$$\alpha_o = \frac{1}{2}(\alpha_*^{\alpha} + \beta_*^{\alpha} + \alpha_*^{\beta} - \beta_*^{\beta})$$

$$\beta_o = \frac{1}{2}(-\alpha_*^{\alpha} + \beta_*^{\alpha} + \alpha_*^{\beta} + \beta_*^{\beta})$$

The tunnel angularity is found similarly by the formulas

$$\alpha^* = \frac{1}{2}(-\alpha_*^{\alpha} - \beta_*^{\alpha} + \alpha_*^{\beta} + \beta_*^{\beta})$$

$$\beta^* = \frac{1}{2}(\alpha_*^{\alpha} - \beta_*^{\alpha} - \alpha_*^{\beta} + \beta_*^{\beta})$$

The determination of the constants A and θ_o completes the calibration of the total angle θ. It is then a simple matter to fit the q and p_s calibration constants to the calculated values of θ in the least-squares sense. It was found that the low angle values were not fitted as well as the intermediate values. To improve these calculations for angles less than 12^o, a separate method was used, where q was calculated as a constant multiple of q_p, and p_s was found by subtracting q from p_1.

The following table gives the maximum and minimum values of the calibration constants from equations (A6) to (A8) that were found for the seven probes used in this report, and a comparison with the theoretical values predicted from potential flow theory:

	A	B	C	D	E	F	α_o	β_o	ψ_o	θ_o
Theoretical	2.67	0.84	0.00	1.13	0.00	-0.13	0.00	0.00	0.00	54.7
Experimental maximum	3.66	.64	1.37	.52	3.37	-1.87	.42	.89	2.11	57.4
Experimental minimum	2.63	.04	.51	.22	2.46	-2.64	-1.43	-.86	-4.40	50.1

The principal part of the difference between the experimental and theoretical values is due to errors in the port placement. The average angle of the yaw and pitch ports was found not to be at 45^o as was specified on the construction drawings, but was typically at about 38^o.

The calibration data, as well as other data taken at combined yaw and pitch angles, were reduced to determine the errors associated with the scheme. The

total angle θ was found to be accurate within 1° and the roll angle ψ within 3°. The dynamic pressure q was accurate within about 2.5 percent for angles less than 25° and 5 percent elsewhere. The static pressure p_s was accurate within about 2 percent for angles less than 25° and 4 percent elsewhere. These are rough averages for all the probes; some probes exceeded these values in some instances. The most serious of these exceptions was in the dynamic pressure calculation which occasionally had errors of 8 to 10 percent but never exceeded this value in the region of interest.

APPENDIX B

WIND-TUNNEL POSITIONING OF THE RAKE OF YAW-PITCH PROBES

The decision to measure velocities in planes perpendicular to the jet path placed stringent requirements on the location and orientation of the rake of probes. These requirements had to be reconciled with the types and ranges of motion available for the rake in such a way that the test could be conducted in a reasonable length of time. A knowledge of the motions available for the rake and of the relative positions of the jet and sting system are necessary to understand the compromises that were made.

The types of motion available for the rake of the probes can be divided into two categories: those motions provided by the wind-tunnel sting system and those which were used specifically for this experiment. Three types of motion were available for the wind-tunnel sting system: pitch, yaw, and height. Figure B1 is a schematic of the wind-tunnel sting system illustrating the movements of pitch and height. Yaw was accomplished by rotation about the vertical axis noted in figure B1. Pitch, yaw, and height of the tunnel sting could be changed and monitored from the control room, and their values were automatically recorded on magnetic tape for each point of data. Longitudinal motion in the tunnel was achieved in one of two ways. The bolts clamping the 15-cm-diameter (6-in.) pipe in the sleeve could be loosened and the pipe moved in the sleeve to a new location. This was a task which required about 1/2 hour to perform. Additionally, a rather small range of longitudinal motion (approximately 4D) was provided by a lead screw apparatus between the adapter sting and the 15-cm (6-in.) pipe. The position of the lead screw was controlled and monitored from the control room, and its position was recorded on magnetic tape for each point of data. Finally, the angle between the rake sting and the adapter sting could be changed in 5° increments. (See figs. 4 and 6.) The roll position of the rake on the rake sting was such that the plane of the rake airfoil was vertical when the tunnel pitch and yaw angles were zero. The rake sting angle ϕ_R, X^4, and Z^4 were manually entered in the data acquisition system and recorded on magnetic tape for each point of data.

The jet was laterally offset 33.8 cm (13.3 in.) from the tunnel center line because of a large beam under the tunnel floor. The yaw angle necessary to locate the rake in the XZ plane ranged from 2.5° if the probe tips were at the center of the jet orifice to 6.3° for the probes located 45D downstream of the orifice.

To acquire a series of velocity measurements which were approximately in a given jet cross section, the following procedure was used: The angle between the rake sting and adapter sting was set to the 5° increment nearest the desired angle of inclination of the plane and secured with a tapered pin and bolt through holes in the bracket. (See fig. 4.) The wind-tunnel sting pitch was then used to set the rake sting at the desired angle as measured by an inclinometer. The tip of probe 4 of the rake was positioned in the jet symmetry plane at the desired values of X and Z as physically measured in the tunnel. Yaw of the tunnel sting system was used to move the rake to positions out of the

Appendix B

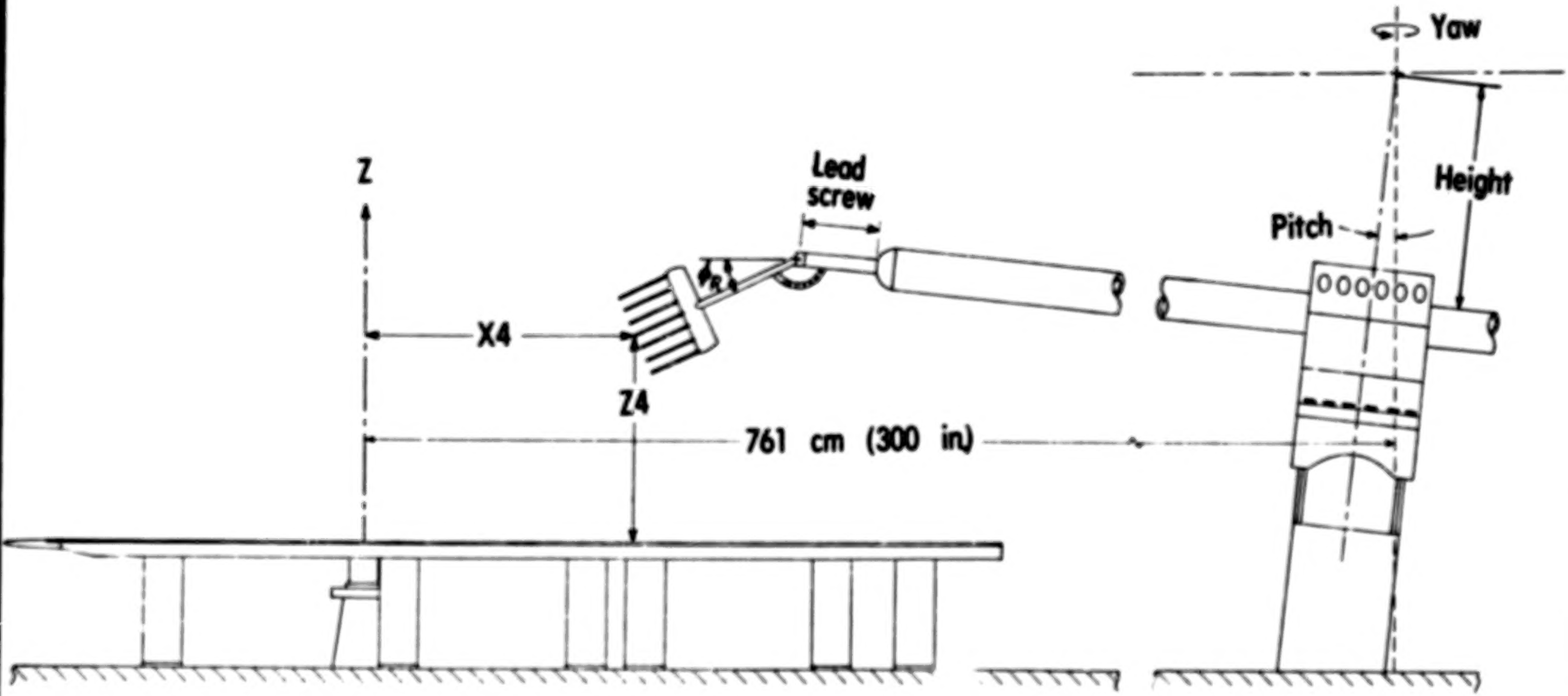


Figure B1.- Schematic of rake positioning system.

jet symmetry plane. This produced a cross section with a small amount of curvature. In the $y > 0$ half-plane where most of the data were taken, this curvature resulted in a maximum out-of-plane movement of 0.07D at the jet orifice to 0.18D at 45D downstream. The larger value downstream is offset by the smaller change in conditions in the X-direction there.

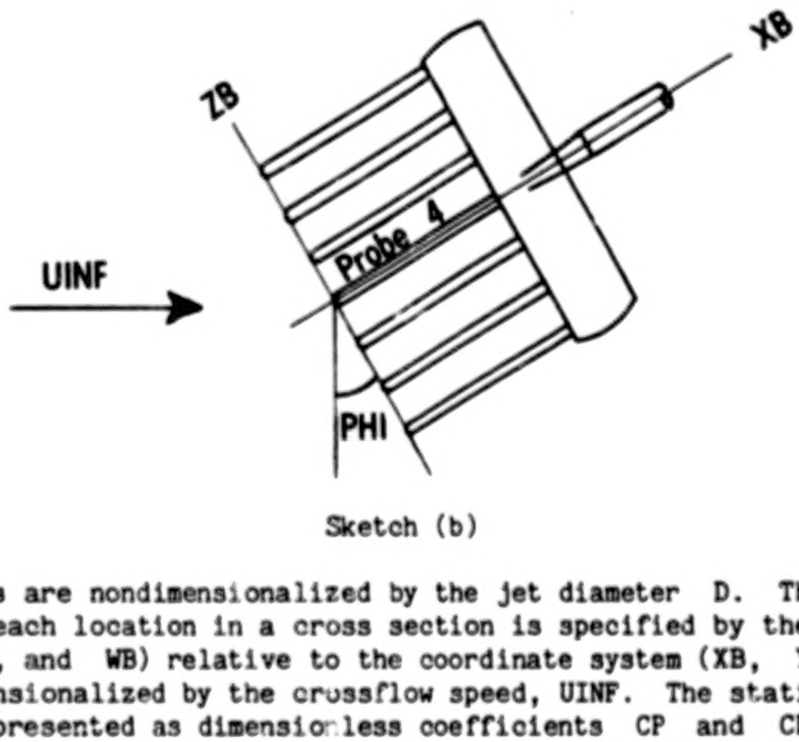
Errors in tunnel position were mainly due to shifts in the position of the yaw table on which the tunnel sting system was mounted. (See fig. 6.) The inaccuracy in Y-position had the largest magnitude, inaccuracies rarely exceeding 0.1D. The X-position was repeatable to within 0.04D, and the Z-position was repeatable to within 0.01D.

APPENDIX C

EXPERIMENTALLY DETERMINED VELOCITIES AND PRESSURES

Presentation of Results

The basic results of this investigation are the measured pressures and the velocities determined from them. For presentation these measurements are arranged in three major groupings: (1) jet center-line data which consist of measurements in the plane of flow symmetry for the purpose of establishing the jet center line, (2) vortex curve data which also consist of measurements in the plane of flow symmetry but for the purpose of establishing the vortex curve and for use in the vortex filament model, and (3) extended cross sections which contain measurements taken out of the plane of flow symmetry. For each of these groups of data, the location of a cross section is given by the location of the tip of probe 4 of the rake in the wind-tunnel coordinate system (x/D, y/D, and z/D) and the inclination of the rake with the Z-axis, PHI. For the tables of symmetry plane data, y/D is zero. The locations of points within a cross section are given by their coordinates (XB, YB, and ZB) in a system obtained by rotating the wind-tunnel coordinate system through an angle PHI and locating the origin at the tip of probe 4 of the rake of seven yaw-pitch probes. (See sketch (b).)



Sketch (b)

All coordinates are nondimensionalized by the jet diameter D. The velocity determined at each location in a cross section is specified by the three components (UB, VB, and WB) relative to the coordinate system (XB, YB, and ZB) and is nondimensionalized by the crossflow speed, UINF. The static and total pressures are presented as dimensionless coefficients CP and CPT which are defined as

$$\left.\begin{aligned} C_p &= CP = \frac{p - p_\infty}{q_\infty} \\ C_{p,t} &= CPT = \frac{p_t - p_{t,\infty}}{q_\infty} \end{aligned}\right\} \qquad (C1)$$

The following annotation is used throughout the tables:

$ denotes points outside probe calibration range

Index to Tables

An index to the tables of this appendix follows:

Table C1.- Symmetry plane velocities and pressures, jet center line

(a) R = 3; U_∞ = 53 m/sec; x/D = 2.0, 3.9, 6.0, 7.8, 9.5, 12.1, 14.1

(b) R = 4; U_∞ = 39 m/sec; x/D = 2.0, 2.7, 3.9, 5.2, 5.8, 7.9, 8.4, 12.1, 14.0, 15.8, 18.0

(c) R = 5; U_∞ = 50 m/sec; x/D = 2.0, 6.0, 9.7, 14.1

(d) R = 6; U_∞ = 42 m/sec; x/D = 1.9, 3.9, 6.1, 7.8, 9.6, 11.9, 14.0, 18.1
R = 6; U_∞ = 51 m/sec; x/D = 14.0

(e) R = 7; U_∞ = 44 m/sec; x/D = 2.0, 6.0, 9.9, 13.9

(f) R = 8; U_∞ = 31 m/sec; x/D = 1.8, 2.0, 14.0
R = 8; U_∞ = 39 m/sec; x/D = 2.0, 3.7, 3.8, 6.1, 6.5, 7.7, 10.0, 12.0, 14.0, 18.1

(g) R = 10; U_∞ = 25 m/sec; x/D = 2.0, 14.0
R = 10; U_∞ = 31 m/sec; x/D = 2.0, 4.0, 6.1, 8.0, 10.2, 12.1, 14.0

Table C2.- Symmetry plane velocities and pressures, vortex curve

(a) R = 3; U_∞ = 34 m/sec; x/D = 2.0, 6.0, 8.0, 14.0
R = 3; U_∞ = 53 m/sec; x/D = 2.0, 4.0, 6.0, 8.0, 9.5, 12.0, 14.0, 18.0, 25.0

(b) R = 4; U_∞ = 25 m/sec; x/D = 2.0, 6.0, 14.0
R = 4; U_∞ = 39 m/sec; x/D = 2.0, 4.0, 6.0, 8.0, 9.1, 9.2, 14.0, 18.0, 25.0, 35.0, 45.0
R = 4; U_∞ = 62 m/sec; x/D = 2.0, 6.0, 14.0

(c) R = 5; U_∞ = 50 m/sec; x/D = 2.0, 2.1, 6.0, 9.7, 14.0

(d) R = 6; U_∞ = 26 m/sec; x/D = 2.0, 6.0, 14.0
R = 6; U_∞ = 42 m/sec; x/D = 2.0, 4.0, 6.0, 8.0, 9.5, 12.0, 14.0, 18.0, 25.0, 35.0, 45.0
R = 6; U_∞ = 51 m/sec; x/D = 2.0, 6.0, 14.0

(e) R = 7; U_∞ = 44 m/sec; x/D = 2.0, 6.0, 9.9, 14.0

(f) R = 8; U_∞ = 19 m/sec; x/D = 2.0, 6.0, 15.2
R = 8; U_∞ = 31 m/sec; x/D = 2.0, 6.0, 15.2
R = 8; U_∞ = 39 m/sec; x/D = 2.0, 4.0, 5.6, 6.0, 8.0, 8.8, 9.8, 12.0, 15.2, 18.0, 25.0, 35.0, 45.0

(g) R = 10; U_∞ = 25 m/sec; x/D = 2.0, 6.0, 14.0
R = 10; U_∞ = 31 m/sec; x/D = 2.0, 4.0, 6.0, 8.0, 10.0, 12.1, 14.0, 18.0

Table C3.- Cross-section velocities and pressures

(a) R = 3; U_∞ = 53 m/sec; x/D = 2.0, 6.0, 8.0
z/D = 2.0, 3.0, 3.0

(b) R = 4; U_∞ = 39 m/sec; x/D = 2.0, 2.0, 2.7, 4.2, 4.7, 5.2, 6.0, 8.4
z/D = 2.5, 4.3, 4.6, 2.0, 2.0, 5.8, 4.0, 6.8
R = 4; U_∞ = 39 m/sec; x/D = 9.2, 14.0, 14.0, 15.8, 35.0, 45.0
z/D = 3.9, 6.0, 8.3, 8.6, 8.5, 9.8

(c) R = 6; U_∞ = 42 m/sec; x/D = 2.0, 6.0, 14.0, 14.0, 35.0, 45.0
z/D = 3.5, 6.0, 8.5, 11.5, 13.0, 14.8

(d) R = 8; U_∞ = 39 m/sec; x/D = 2.0, 2.0, 3.7, 5.6, 7.6, 6.0, 6.5, 8.8
z/D = 5.0, 6.8, 9.4, 7.1, 4.8, 8.0, 11.4, 8.3
R = 8; U_∞ = 39 m/sec; x/D = 10.0, 11.9, 12.1, 13.1, 14.0, 15.2, 35.0, 45.0
z/D = 5.3, 2.3, 17.0, 14.2, 15.3, 12.0, 18.0, 19.5
R = 8; U_∞ = 20 m/sec; x/D = 14.0; z/D = 15.3

(e) R = 10; U_∞ = 25 m/sec; x/D = 2.0, 1.8
z/D = 6.0, 7.7
R = 10; U_∞ = 31 m/sec; x/D = 2.0, 2.0, 6.0
z/D = 6.0, 7.8, 10.0

Table C4.- Vertical section velocities and pressures

(a) R = 4; U_∞ = 39 m/sec; z/D = 1.75; x/D = 4.0, 6.0, 8.0

(b) R = 8; U_∞ = 39 m/sec; z/D = 1.75; x/D = 4.0, 6.0, 8.0, 12.0

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 3.17	.42	.48	.43	1.06	1.29	.95	.93	UB/UINF	.69	.70	.91	1.07	1.15	1.08	1.03	R= 3.16
UINF= 51.3 M/SEC	.03	-.08	-.03	.07	.05	.03	.04	VB/UINF	-.02	-.01	-.00	.01	.02	.01	.01	UINF= 52.0 M/SEC
X/D= 1.98	.73	.39	.06	.29	.16	-.13	-.25	WB/UINF	.25	.10	.02	-.07	-.06	-.08	-.16	X/D= 7.06
Z/D= 3.25	-1.15	-1.26	-1.08	-1.33	-.42	.06	.09	CP	-.29	-.27	-.27	-.21	-.19	-.10	-.07	Z/D= 5.22
PHI= 22.0 DEG	-1.43	-1.85	-1.09	1.25	.29	-.03	.07	CPT	-.76	-.77	-.44	-.06	.16	.08	.02	PHI= 11.0 DEG
R= 3.17	.41	.198	.41	1.06	1.26	.95	.93	UB/UINF	.68	.81	.86	1.09	1.13	1.09	1.01	R= 3.16
UINF= 51.3 M/SEC	-.07	.01	-.01	.05	.08	.06	.04	VB/UINF	-.04	-.01	-.01	.01	-.08	.02	-.00	UINF= 52.0 M/SEC
X/D= 1.98	.87	.61	.16	.22	.17	-.13	-.25	WB/UINF	.28	.12	-.02	-.06	-.06	-.07	-.16	X/D= 7.06
Z/D= 3.25	-.80	-.75	-1.05	-1.28	-.37	.05	.13	CP	-.25	-.32	-.26	-.20	-.17	-.12	-.06	Z/D= 5.22
PHI= 22.0 DEG	-.87	-1.35	-1.07	1.23	.21	-.02	.03	CPT	-.76	-.65	-.53	-.08	.13	.08	.01	PHI= 11.0 DEG
R= 3.18	.57	.35	.36	1.91	1.39	.96	.91	UB/UINF	.76	.76	.89	.99	1.10	1.06	1.02	R= 3.18
UINF= 50.9 M/SEC	-.09	-.01	-.05	.05	.05	.04	.05	VB/UINF	-.05	-.03	.01	.05	.01	.02	-.00	UINF= 52.9 M/SEC
X/D= 2.00	.72	.56	.03	.00	.03	-.26	-.33	WB/UINF	.21	.07	.01	-.08	-.06	-.07	-.13	X/D= 9.50
Z/D= 3.25	-1.00	-.95	-1.03	-1.36	-.48	.06	.10	CP	-.10	-.18	-.19	-.13	-.13	-.08	-.01	Z/D= 5.50
PHI= 20.0 DEG	-1.15	-1.54	-1.90	1.	.49	.01	.03	CPT	-.56	-.55	-.39	-.15	.09	.06	.06	PHI= 10.0 DEG
R= 3.18	.56	.48	.21	[illegible]	.99	.92	.92	UB/UINF	.82	.75	.90	1.00	1.07	1.07	1.02	R= 3.19
UINF= 51.0 M/SEC	-.10	-.05	-.12	[illegible]	.06	.05	.03	VB/UINF	-.02	-.09	.01	-.02	.01	.02	.04	UINF= 52.9 M/SEC
X/D= 2.00	.69	.48	.26	[illegible]	.06	-.23	-.33	WB/UINF	.19	.09	-.02	-.04	-.06	-.09	-.13	X/D= 9.50
Z/D= 3.25	-1.04	-1.14	-.90	-1.31	-.46	.09	.10	CP	-.22	-.10	-.17	-.12	-.08	-.07	-.06	Z/D= 5.50
PHI= 20.0 DEG	-1.26	-1.68	-1.78	1.11	.49	-.01	.06	CPT	-.51	-.61	-.36	-.12	.08	.10	.03	PHI= 10.0 DEG
R= 3.16	.40	.45	.96	1.44	1.25	1.03	.99	UB/UINF	.95	1.01	1.05	1.06	1.02	1.01	1.00	R= 3.17
UINF= 51.6 M/SEC	-.08	-.06	.01	.07	-.00	.00	.01	VB/UINF	-.08	-.07	.00	.01	.00	.01	.00	UINF= 52.0 M/SEC
X/D= 3.85	.48	.19	-.06	-.00	-.07	-.10	-.10	WB/UINF	-.06	-.07	-.08	-.10	-.11	-.12	-.16	X/D= 12.00
Z/D= 4.24	-.48	-.60	-.56	-.53	-.29	-.10	-.03	CP	-.10	-.13	-.11	-.08	-.06	-.03	-.03	Z/D= 7.00
PHI= 16.0 DEG	-1.07	-1.36	-.81	.58	.28	-.03	-.01	CPT	-.28	-.10	.00	.03	.01	-.00	-.00	PHI= 9.0 DEG
R= 3.16	.51	.29	.90	1.47	1.24	1.00	.99	UB/UINF	.90	1.03	1.02	1.02	1.01	1.01	1.01	R= 3.17
UINF= 51.7 M/SEC	.00	.03	.03	.02	.02	.02	.03	VB/UINF	-.01	.00	.02	.09	-.30	.00	.01	UINF= 52.0 M/SEC
X/D= 3.85	.53	.33	-.05	.03	-.01	-.12	-.20	WB/UINF	-.02	-.07	-.08	-.10	-.10	-.12	-.15	X/D= 12.00
Z/D= 4.24	-.55	-.44	-.59	-.61	-.38	-.06	-.03	CP	-.15	-.17	-.10	-.09	-.08	-.08	-.05	Z/D= 7.00
PHI= 16.0 DEG	-1.01	-1.25	-.74	.57	.75	-.03	-.01	CPT	-.36	-.10	-.03	-.02	-.03	-.01	-.01	PHI= 9.0 DEG
R= 3.18	.76	.63	.62	.85	1.14	1.22	1.05	UB/UINF	.95	1.04	1.07	1.03	1.07	1.02	1.01	R= 3.16
UINF= 52.0 M/SEC	.03	-.08	-.06	-.03	-.02	.01	-.01	VB/UINF	-.01	.02	.02	.00	.01	.02	.01	UINF= 52.0 M/SEC
X/D= 5.96	.36	.30	.13	-.01	-.08	-.04	-.10	WB/UINF	-.02	-.05	-.07	-.09	-.11	-.11	-.13	X/D= 14.12
Z/D= 6.25	-.44	-.43	-.38	-.35	-.33	-.24	-.11	CP	-.13	-.17	-.12	-.09	-.08	-.08	-.06	Z/D= 7.50
PHI= 12.9 DEG	-.72	-.95	-.97	-.63	-.02	.25	.01	CPT	-.22	-.08	.06	-.01	-.01	-.02	-.02	PHI= 8.0 DEG
R= 3.17	.71	.55	.60	.80	1.15	1.18	1.10	UB/UINF	.96	1.02	1.06	1.06	1.02	1.02	1.01	R= 3.17
UINF= 52.9 M/SEC	.02	-.08	-.09	-.02	.01	.01	.02	VB/UINF	.01	-.01	.01	.01	-.00	.02	.01	UINF= 52.0 M/SEC
X/D= 5.96	.33	.36	.16	-.03	-.06	-.06	-.12	WB/UINF	-.06	-.08	-.08	-.10	-.10	-.11	-.14	X/D= 14.12
Z/D= 6.25	-.35	-.32	-.36	-.30	-.32	-.21	-.16	CP	-.15	-.14	-.10	-.09	-.08	-.09	-.06	Z/D= 7.50
PHI= 12.9 DEG	-.74	-.88	-.98	-.66	.01	.19	.09	CPT	-.23	-.10	.06	.01	-.01	-.03	-.02	PHI= 8.0 DEG

TABLE C1.- SYMMETRY PLANE VELOCITIES AND PRESSURES, JET CENTER LINE

(a) R = 3.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 4.14	.41	.115	.86	1.96	1.31	.86	.86	UB/UINF	.69	.82	1.05	1.33	1.15	1.05	.93	R= 3.98
UINF= 30.2 M/SEC	.00	.07	.05	.07	.00	.03	.05	VB/UINF	-.02	.02	.01	.02	-.07	-.02	.02	UINF= 30.8 M/SEC
X/D= 1.97	.66	.63	.01	.25	.14	-.17	-.31	WB/UINF	.14	-.00	-.16	-.13	-.12	-.15	-.26	X/D= 5.20
Z/D= 4.25	-1.32	-.80	-1.31	-1.37	-.45	.17	.20	CP	-.55	-.48	-.47	-.32	-.18	-.10	.08	Z/D= 5.61
PHI= 28.0 DEG	-1.71	-1.38	-1.56	1.58	.29	-.06	.05	CPT	-1.05	-.80	-.36	.48	.17	.03	.02	PHI= 21.3 DEG
R= 4.13	.31	.27	1.10	1.96	1.30	.90	.86	UB/UINF	.64	.81	1.05	1.28	1.27	1.01	.96	R= 4.08
UINF= 30.3 M/SEC	-.06	-.04	.03	.03	.05	.03	.06	VB/UINF	.01	.00	.01	.01	.00	-.00	.03	UINF= 30.8 M/SEC
X/D= 1.97	.82	.39	.02	.27	.12	-.18	-.32	WB/UINF	.20	.00	-.13	-.13	-.12	-.18	-.26	X/D= 5.20
Z/D= 4.25	-.86	-1.24	-1.36	-1.26	-.50	.12	.22	CP	-.49	-.50	-.48	-.33	-.21	-.08	.06	Z/D= 5.61
PHI= 28.0 DEG	-1.08	-2.01	-1.15	1.64	.23	-.04	.06	CPT	-1.04	-.85	-.35	.35	.41	.01	.05	PHI= 21.3 DEG
R= 4.15	.66	.29	.89	2.08	1.58	.90	.84	UB/UINF	.67	.63	.88	1.16	1.28	1.13	1.08	R= 4.19
UINF= 30.3 M/SEC	-.07	-.02	-.00	.09	.03	.06	.06	VB/UINF	-.10	-.04	.00	.01	.02	.01	.00	UINF= 30.6 M/SEC
X/D= 2.00	.68	.47	.01	.06	.06	-.24	-.36	WB/UINF	.33	.21	-.01	-.05	-.05	-.08	-.16	X/D= 5.82
Z/D= 4.25	-1.19	-1.16	-1.39	-1.53	-.70	.08	.19	CP	-.49	-.53	-.52	-.52	-.38	-.24	-.15	Z/D= 5.76
PHI= 33.0 DEG	-1.53	-1.88	-1.59	1.87	.82	-.05	.03	CPT	-.93	-1.10	-.75	-.15	.28	.04	.06	PHI= 17.0 DEG
R= 4.15	.41	.255	.73	1.99	1.44	.89	.82	UB/UINF	.68	.76	.76	1.04	1.29	1.22	1.05	R= 4.22
UINF= 30.3 M/SEC	-.03	.09	.11	.09	.09	.05	.06	VB/UINF	.02	.04	.01	-.01	.01	.02	.02	UINF= 30.6 M/SEC
X/D= 2.00	.86	.72	-.13	.01	.06	-.22	-.36	WB/UINF	.26	.20	.08	-.06	-.07	-.06	-.17	X/D= 5.82
Z/D= 4.25	-.81	-.66	-1.30	-1.57	-.63	.10	.19	CP	-.61	-.63	-.56	-.52	-.41	-.22	-.13	Z/D= 5.76
PHI= 33.0 DEG	-.96	-1.07	-1.76	1.67	.67	-.06	-.02	CPT	-1.10	-1.06	-.96	-.66	.78	.27	.01	PHI= 17.0 DEG
R= 4.08	.40	.37	1.17	1.76	1.26	.88	.83	UB/UINF	.75	.96	1.07	1.25	1.12	1.04	1.01	R= 4.15
UINF= 30.6 M/SEC	.06	.02	-.00	-.01	-.05	-.03	.00	VB/UINF	.01	-.05	.05	.02	.03	.02	.02	UINF= 39.5 M/SEC
X/D= 2.66	.50	.20	-.10	-.10	-.10	-.26	-.36	WB/UINF	.12	-.02	-.09	-.08	-.12	-.11	-.16	X/D= 7.87
Z/D= 4.63	-.73	-.77	-.07	-.76	-.21	.17	.27	CP	-.39	-.41	-.35	-.35	-.19	-.12	-.06	Z/D= 6.75
PHI= 31.8 DEG	-1.31	-1.56	-.47	1.32	.96	.01	.10	CPT	-.81	-.47	-.18	.23	.10	-.02	-.01	PHI= 14.0 DEG
R= 4.08	.66	.46	1.10	1.69	1.18	.89	.81	UB/UINF	.82	.86	1.11	1.23	1.16	1.08	1.02	R= 4.16
UINF= 30.7 M/SEC	-.01	-.04	.03	-.01	-.03	-.04	-.00	VB/UINF	-.03	.01	-.02	.06	.01	.02	.02	UINF= 39.5 M/SEC
X/D= 2.66	.49	.23	-.12	-.07	-.08	-.28	-.38	WB/UINF	.07	-.01	-.08	-.07	-.07	-.10	-.19	X/D= 7.87
Z/D= 4.63	-.67	-.78	-.04	-.08	-.18	.23	.37	CP	-.42	-.38	-.33	-.31	-.23	-.13	-.09	Z/D= 6.75
PHI= 31.8 DEG	-1.23	-1.43	-.42	1.22	.22	.10	.18	CPT	-.75	-.65	-.09	.22	.13	.04	-.01	PHI= 14.0 DEG
R= 4.13	.39	.50	.73	1.23	1.53	1.16	.97	UB/UINF	[illegible]	1.03	1.27	1.19	1.10	1.04	1.00	R= 4.08
UINF= 30.7 M/SEC	.05	.07	.01	.01	.05	-.02	-.00	VB/UINF	[illegible]	-.01	-.02	.01	-.07	-.01	-.03	UINF= 30.0 M/SEC
X/D= 3.80	.61	.29	.06	-.01	.04	-.01	-.17	WB/UINF	.09	.02	-.03	-.02	-.06	-.08	-.13	X/D= 8.66
Z/D= 5.00	-.56	-.89	-.83	-.76	-.57	-.21	-.01	CP	-.30	-.35	-.26	-.23	-.10	-.10	.01	Z/D= 6.76
PHI= 20.0 DEG	-1.03	-1.55	-1.29	-.23	.79	.15	-.04	CPT	-.77	-.29	-.10	.19	.17	.04	.03	PHI= 11.0 DEG
R= 4.13	.68	.57	.80	1.37	1.96	1.18	.99	UB/UINF	.76	.90	1.11	1.16	1.15	1.04	.96	R= 4.08
UINF= 30.7 M/SEC	-.05	-.02	-.03	-.00	.06	.04	-.02	VB/UINF	-.00	-.04	-.03	-.03	-.01	-.01	-.01	UINF= 30.8 M/SEC
X/D= 3.80	.53	.27	.04	-.01	.06	-.01	-.17	WB/UINF	.10	-.00	-.03	-.00	-.06	-.08	-.13	X/D= 8.66
Z/D= 5.00	-.67	-.84	-.76	-.77	-.58	-.26	-.06	CP	-.38	-.31	-.27	-.25	-.15	-.06	.03	Z/D= 6.76
PHI= 20.0 DEG	-1.10	-1.69	-1.14	.12	.86	.16	-.03	CPT	-.76	-.51	-.06	.11	.18	.04	.01	PHI= 11.0 DEG

TABLE C1.- Continued

(b) R = 4.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5
R= 4.13	.97	1.10	1.11	1.14	1.02	1.02	1.03
UINF= 39.6 M/SEC	.03	.01	.03	.01	.01	-.01	.01
X/D= 12.05	-.07	-.08	-.14	-.12	-.15	-.14	-.19
Z/D= 8.00	-.26	-.21	-.19	-.19	-.07	-.06	-.05
PHI= 12.0 DEG	-.31	.01	.08	.14	.00	-.01	.05
R= 4.13	.91	.95	1.08	1.10	1.06	1.02	.99
UINF= 39.6 M/SEC	-.01	.02	-.01	-.00	.01	.01	.01
X/D= 12.05	-.10	-.15	-.13	-.11	-.15	-.14	-.20
Z/D= 8.00	-.22	-.14	-.17	-.11	-.09	-.03	-.01
PHI= 12.0 DEG	-.37	-.21	.02	.11	.05	.02	.02
R= 4.14	.93	1.01	1.04	1.06	1.06	1.03	1.00
UINF= 39.5 M/SEC	-.01	.04	-.00	.02	.03	.02	.00
X/D= 14.00	-.07	-.12	-.11	-.11	-.13	-.15	-.17
Z/D= 8.25	-.13	-.11	-.09	-.05	-.06	.01	.04
PHI= 10.5 DEG	-.25	-.06	.02	.09	.10	.09	.08
R= 4.14	.91	1.03	1.03	1.06	1.05	1.05	1.02
UINF= 39.5 M/SEC	.01	-.02	.03	.00	.00	.02	.02
X/D= 14.00	-.09	-.14	-.10	-.09	-.13	-.12	-.17
Z/D= 8.25	-.11	-.13	-.05	-.02	-.01	-.02	.03
PHI= 10.5 DEG	-.27	-.05	.02	.11	.11	.11	.10
R= 3.99	1.00	1.00	1.05	1.06	1.04	.99	.95
UINF= 38.5 M/SEC	.01	.00	.01	-.01	-.01	-.01	.02
X/D= 15.78	-.11	-.14	-.12	-.11	-.11	-.12	-.14
Z/D= 8.60	-.17	-.11	-.06	-.06	-.05	.04	.09
PHI= 10.0 DEG	-.15	-.10	.07	.09	.05	.01	.02
R= 4.02	1.09	1.05	1.04	1.07	1.04	.99	.96
UINF= 38.6 M/SEC	-.01	.01	.00	-.01	-.02	-.00	.01
X/D= 15.78	-.08	-.12	-.12	-.12	-.11	-.12	-.16
Z/D= 8.60	-.13	-.13	-.08	-.01	-.05	.01	.07
PHI= 10.0 DEG	-.11	-.01	.02	.05	.05	.01	.03
R= 4.12	.92	1.05	1.03	1.06	1.03	1.01	1.01
UINF= 38.8 M/SEC	.00	.03	.02	.02	-.00	.00	.01
X/D= 18.01	-.09	-.10	-.12	-.14	-.09	-.14	-.15
Z/D= 8.75	-.15	-.22	-.17	-.16	-.13	-.09	-.08
PHI= 10.2 DEG	-.30	-.11	-.09	-.08	-.05	-.06	-.04
R= 4.13	.95	.98	1.02	1.04	1.02	.99	1.00
UINF= 38.9 M/SEC	.02	-.00	.02	.04	.00	.01	.02
X/D= 18.01	-.12	-.12	-.13	-.13	-.16	-.11	-.15
Z/D= 8.75	-.20	-.19	-.16	-.13	-.08	-.07	-.05
PHI= 10.2 DEG	-.27	-.21	-.10	-.04	-.01	-.06	-.03

	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
UB/UINF	.53	.55	1.37	2.17	1.32	.82	.81	R= 5.05
VB/UINF	-.13	.04	.09	.06	.05	.03	.04	UINF= 49.4 M/SEC
WB/UINF	.84	.46	.09	.36	.29	-.20	-.32	X/D= 1.97
CP	-1.41	-1.42	-1.56	-1.33	-.68	.13	.23	Z/C= 5.25
CPT	-1.41	-1.90	-.46	2.43	.37	-.10	.00	PHI= 33.0 DEG
UB/UINF	.58	.68	1.35	2.19	1.20	.83	.77	R= 5.06
VB/UINF	-.05	-.05	.00	.04	-.01	.01	.02	UINF= 49.4 M/SEC
WB/UINF	.82	.47	.12	.32	.24	-.10	-.33	X/D= 1.97
CP	-1.43	-1.32	-1.56	-1.61	-.29	.13	.29	Z/D= 5.25
CPT	-1.42	-1.86	-.71	2.43	.21	-.15	-.01	PHI= 33.0 DEG
UB/UINF	.73	.80	.92	1.25	1.33	1.24	1.09	R= 5.10
VB/UINF	-.05	-.03	.00	.03	.00	.03	.03	UINF= 49.2 M/SEC
WB/UINF	.38	.22	.10	.00	-.02	-.05	-.14	X/D= 6.03
CP	-.49	-.61	-.57	-.53	-.39	-.25	-.20	Z/D= 7.25
CPT	-.81	-.91	-.72	.06	.41	.32	.03	PHI= 20.0 DEG
UB/UINF	.83	.79	.99	1.16	1.39	1.24	1.04	R= 5.09
VB/UINF	-.09	-.02	-.02	.01	.01	.02	.02	UINF= 49.7 M/SEC
WB/UINF	.30	.23	.06	-.01	-.03	-.08	-.15	X/D= 6.03
CP	-.63	-.54	-.57	-.40	-.42	-.24	-.14	Z/D= 7.25
CPT	-.83	-.86	-.58	-.03	.52	.33	-.02	PHI= 20.0 DEG
UB/UINF	1.06	1.14	1.15	1.07	1.01	.99	.98	R= 5.06
VB/UINF	.02	-.01	.00	.02	-.00	.01	.00	UINF= 51.1 M/SEC
WB/UINF	-.06	-.06	-.07	-.09	-.15	-.17	-.22	X/D= 9.71
CP	-.31	-.26	-.19	-.12	-.07	-.03	.00	Z/D= 9.78
CPT	-.13	.04	.16	.04	-.02	-.02	.01	PHI= 15.0 DEG
UB/UINF	1.08	1.18	1.16	1.10	1.03	.99	.97	R= 5.06
VB/UINF	-.02	.02	.01	-.01	-.00	.02	.00	UINF= 51.1 M/SEC
WB/UINF	-.04	-.08	-.07	-.10	-.14	-.17	-.20	X/D= 9.71
CP	-.28	-.27	-.16	-.11	-.07	-.03	.02	Z/D= 9.78
CPT	-.10	.15	.20	.11	.02	-.02	.01	PHI= 15.0 DEG
UB/UINF	.91	.94	1.07	1.09	1.09	1.01	1.00	R= 5.05
VB/UINF	-.03	-.01	-.01	.02	.01	.03	.02	UINF= 51.2 M/SEC
WB/UINF	.01	-.07	-.04	-.10	-.13	-.14	-.15	X/D= 14.12
CP	-.20	-.17	-.18	-.17	-.12	-.06	-.03	Z/D= 10.00
CPT	-.37	-.29	-.01	.04	.08	-.01	-.08	PHI= 13.0 DEG
UB/UINF	.89	1.00	1.06	1.04	1.08	1.04	.96	R= 5.05
VB/UINF	-.02	-.04	.01	-.01	.02	.01	.01	UINF= 51.2 M/SEC
WB/UINF	-.03	-.05	-.10	-.11	-.12	-.13	-.17	X/D= 14.12
CP	-.23	-.24	-.19	-.13	-.16	-.09	-.04	Z/D= 10.00
CPT	-.43	-.22	-.06	-.02	.04	.02	-.02	PHI= 13.0 DEG

TABLE C1.- Continued

(b) Concluded. (c) R = 5.

TEST CONDITIONS	ZH/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 6.02	.73	1.28	2.15	1.61	1.06	.76	.68	UB/UINF	1.11	1.29	1.16	1.09	1.01	1.00	.96	R= 6.05
UINF= 41.4 M/SEC	-.13	.03	.10	.07	.05	.11	.07	VB/UINF	-.02	.01	.01	.01	.01	.01	.02	UINF= 42.3 M/SEC
X/D= 1.89	.70	.16	.25	.35	-.03	-.26	-.40	WB/UINF	.01	-.03	-.07	-.08	-.14	-.16	-.22	X/D= 9.63
Z/D= 6.50	-1.33	-1.66	-1.55	-.99	-.20	.24	.36	CP	-.27	-.38	-.14	-.15	-.03	-.03	.03	Z/D= 11.50
PHI= 38.0 DEG	-1.29	-.98	2.23	1.47	-.07	-.11	-.01	CPT	-.04	.29	.21	.05	.00	-.00	-.00	PHI= 18.0 DEG
R= 6.04	.82	1.17	2.06	1.90	1.12	.75	.72	UB/UINF	1.04	1.16	1.12	1.02	1.03	.98	.95	R= 6.05
UINF= 41.3 M/SEC	.02	-.04	.09	.09	.08	.06	.04	VB/UINF	.04	.02	.00	.00	.01	.01	.02	UINF= 42.3 M/SEC
X/D= 1.89	.72	.19	.23	.31	-.00	-.29	-.38	WB/UINF	.01	-.07	-.08	[illegible]	-.13	-.16	-.23	X/D= 9.63
Z/D= 6.50	-1.33	-1.57	-1.42	-1.13	-.23	.27	.32	CP	-.25	-.27	-.19	-.09	-.07	-.01	.05	Z/D= 11.50
PHI= 38.0 DEG	-1.14	-1.17	1.95	1.62	.03	-.09	-.02	CPT	-.15	.08	.03	-.04	.03	-.01	.01	PHI= 18.0 DEG
R= 6.04	.91	.82	1.10	1.56	1.45	1.24	.97	UB/UINF	.97	1.05	1.13	1.16	1.10	1.03	1.00	R= 6.04
UINF= 41.2 M/SEC	-.09	-.00	.05	.05	.03	.06	.04	VB/UINF	-.05	-.01	-.03	.01	.00	.00	.00	UINF= 42.2 M/SEC
X/D= 3.91	.68	.57	.22	.16	.20	.04	-.16	WB/UINF	.06	.01	-.06	-.10	-.11	-.14	-.20	X/D= 11.93
Z/D= 7.50	-.98	-.75	-.82	-.83	-.48	-.26	-.04	CP	-.30	-.24	-.19	-.22	-.14	-.07	-.02	Z/D= 11.50
PHI= 28.0 DEG	-.67	-.75	-.56	.60	.68	.29	-.06	CPT	-.35	-.14	.09	.13	.10	.01	.02	PHI= 17.0 DEG
R= 6.03	.76	.73	1.01	1.53	1.52	1.33	.91	UB/UINF	1.06	1.08	1.03	1.14	1.07	.99	.99	R= 6.04
UINF= 41.2 M/SEC	-.03	-.03	.02	.02	.05	.01	.02	VB/UINF	.01	-.01	-.03	.03	.01	-.01	.00	UINF= 42.2 M/SEC
X/D= 3.91	.72	.54	.22	.16	.15	.07	-.13	WB/UINF	.09	-.02	[illegible]	-.08	-.07	-.15	-.20	X/D= 11.93
Z/D= 7.50	-.87	-.64	-.76	-.73	-.55	-.24	.02	CP	-.32	-.29	-.17	-.20	-.11	-.04	-.02	Z/D= 11.50
PHI= 28.0 DEG	-.78	-.87	-.69	.67	.79	.53	-.13	CPT	-.18	-.12	-.10	.10	.05	-.04	.00	PHI= 17.0 DEG
R= 6.06	.92	1.03	1.15	1.45	1.31	1.09	.94	UB/UINF	.92	1.01	.99	1.05	1.05	1.06	1.07	R= 6.04
UINF= 41.0 M/SEC	.01	.11	.04	.05	.03	.05	.01	VB/UINF	-.07	.02	-.01	-.03	-.02	.02	-.01	UINF= 42.4 M/SEC
X/D= 6.10	.40	[illegible]	.01	.01	.00	-.09	-.22	WB/UINF	.11	.07	-.03	-.04	-.07	-.09	-.15	X/D= 14.02
Z/D= 9.00	-.57	-.59	-.40	-.54	-.31	-.09	.11	CP	-.17	-.25	-.20	-.18	-.15	-.07	-.07	Z/D= 11.50
PHI= 24.0 DEG	-.55	-.52	-.07	.57	.41	.12	.04	CPT	-.48	-.22	-.21	-.06	-.03	.06	.11	PHI= 15.0 DEG
R= 6.06	.88	1.02	1.25	1.39	1.33	1.13	.97	UB/UINF	.88	1.09	1.05	1.06	1.09	1.06	1.06	R= 6.04
UINF= 41.2 M/SEC	.03	.02	.01	.07	.02	.03	.02	VB/UINF	-.04	-.01	-.04	-.02	-.02	-.01	.00	UINF= 42.5 M/SEC
X/D= 6.10	.33	.20	.02	.01	-.00	-.08	-.20	WB/UINF	.14	.00	.01	-.08	-.07	-.03	-.14	X/D= 14.02
Z/D= 9.00	-.49	-.57	-.41	-.65	-.26	-.06	.08	CP	-.21	-.28	-.21	-.12	-.15	-.05	-.06	Z/D= 11.50
PHI= 24.0 DEG	-.66	-.49	.16	.50	.53	.23	.06	CPT	-.40	-.09	-.11	.01	.06	.09	.09	PHI= 15.0 DEG
R= 6.04	1.08	1.08	1.23	1.20	1.02	.98	.96	UB/UINF	1.03	1.00	1.08	1.03	1.00	1.01	.99	R= 6.05
UINF= 42.2 M/SEC	.02	-.02	.00	.01	-.01	-.02	.02	VB/UINF	-.01	.02	.02	-.02	.00	-.00	.00	UINF= 41.9 M/SEC
X/D= 7.75	.09	.00	-.01	-.02	-.13	-.16	-.23	WB/UINF	-.04	-.05	-.10	-.12	-.15	-.15	-.20	X/D= 18.08
Z/D= 10.49	-.37	-.28	-.28	-.21	-.08	-.03	.05	CP	-.14	-.11	-.15	-.08	.01	-.01	.02	Z/D= 13.50
PHI= 20.0 DEG	-.19	-.11	.27	.25	-.02	-.03	-.02	CPT	-.07	-.10	.04	.00	.04	.05	[illegible]	PHI= 14.0 DEG
R= 6.04	1.11	1.26	1.29	1.20	1.05	1.00	.95	UB/UINF	1.07	1.03	1.02	1.03	1.00	1.00	.98	R= 6.05
UINF= 42.2 M/SEC	.02	.01	.04	.04	-.00	.01	.01	VB/UINF	.00	-.02	.01	.02	-.01	-.02	-.01	UINF= 41.9 M/SEC
X/D= 7.75	.07	-.04	-.05	-.01	-.08	-.16	-.22	WB/UINF	-.02	-.07	-.08	-.12	-.14	-.13	-.20	X/D= 18.08
Z/D= 10.49	-.43	-.47	-.29	-.24	-.10	-.04	.03	CP	-.20	-.10	-.07	-.05	-.04	-.01	.03	Z/D= 13.50
PHI= 20.0 DEG	-.19	.13	.39	.22	.02	-.02	-.01	CPT	-.05	-.03	-.02	.02	-.03	.02	.03	PHI= 14.0 DEG

TABLE C1.- Continued

(d) R = 6.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5
R= 6.08	.98	.89	1.02	1.07	1.08	1.06	1.03
UINF= 52.7 M/SEC	-.05	-.02	-.06	.00	-.03	-.01	.01
X/D= 14.02	.24	.12	.03	-.03	-.02	-.07	-.12
Z/D= 11.50	-.31	-.26	-.24	-.22	-.13	-.16	-.08
PHI= 15.0 DEG	-.28	-.45	-.19	-.07	.04	.02	.01
R= 6.06	.94	1.01	1.04	1.15	1.10	1.09	1.07
UINF= 52.8 M/SEC	-.07	-.02	-.03	-.07	-.03	.00	-.01
X/D= 14.02	.20	.13	.07	.03	-.07	-.08	-.13
Z/D= 11.50	-.29	-.29	-.25	-.35	-.15	-.15	-.11
PHI= 15.0 DEG	-.36	-.24	-.16	-.03	.06	.05	.05

	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
UB/UINF	.93	.86	1.72	2.53	1.94	1.08	.62	R= 7.04
VB/UINF	-.06	-.03	-.03	.04	-.05	.04	.05	UINF= 44.0 M/SEC
WB/UINF	1.13	.79	.28	.42	.43	.07	-.32	X/D= 1.95
CP	-1.82	-1.38	-1.94	-2.17	-1.09	-.22	.37	Z/D= 7.00
CPT	-.65	-1.01	.13	3.61	1.93	-.04	-.15	PHI= 42.0 DEG
UB/UINF	1.05	.97	1.69	2.35	2.04	.94	.68	R= 7.04
VB/UINF	-.10	-.00	-.07	.02	.01	.09	.06	UINF= 44.1 M/SEC
WB/UINF	1.05	.75	.26	.47	.44	.15	-.31	X/D= 1.95
CP	-2.14	-1.61	-1.89	-1.92	-.98	-.11	.36	Z/D= 7.00
CPT	-.91	-1.11	.08	2.96	2.47	-.20	-.08	PHI= 42.0 DEG
UB/UINF	1.02	.79	1.13	1.29	1.36	1.35	1.22	R= 7.04
VB/UINF	-.06	-.07	-.06	-.01	-.04	-.01	-.01	UINF= 43.8 M/SEC
WB/UINF	.58	.43	.22	.10	.02	-.02	-.07	X/D= 5.95
CP	-.83	-.42	-.56	-.57	-.38	-.34	-.25	Z/D= 10.00
CPT	-.44	-.61	-.21	.12	.49	.50	.24	PHI= 27.0 DEG
UB/UINF	1.08	1.12	1.15	1.32	1.42	1.38	1.20	R= 6.97
VB/UINF	.01	-.12	-.03	-.04	-.04	-.00	.02	UINF= 43.7 M/SEC
WB/UINF	.43	.32	.15	.08	.05	-.02	-.05	X/D= 5.94
CP	-.95	-.88	-.61	-.57	-.46	-.39	-.25	Z/D= 10.00
CPT	-.59	-.49	-.25	.23	.59	.53	.21	PHI= 27.0 DEG
UB/UINF	.97	1.09	1.06	1.15	1.18	1.10	1.01	R= 7.03
VB/UINF	-.02	.01	.01	-.00	-.01	-.01	.01	UINF= 45.1 M/SEC
WB/UINF	.25	.14	.07	-.00	-.02	-.08	-.16	X/D= 9.92
CP	-.36	-.43	-.25	-.23	-.19	-.14	-.07	Z/D= 12.48
CPT	-.35	-.22	-.11	.10	.22	.08	-.02	PHI= 20.0 DEG
UB/UINF	.99	1.04	1.15	1.18	1.14	1.06	1.01	R= 7.03
VB/UINF	-.05	-.06	.02	.03	-.01	.04	.01	UINF= 45.0 M/SEC
WB/UINF	.24	.13	.03	.02	-.05	-.10	-.18	X/D= 9.92
CP	-.47	-.37	-.31	-.28	-.16	-.08	-.03	Z/D= 12.48
CPT	-.42	-.26	.01	.12	.15	.07	.03	PHI= 20.0 DEG
UB/UINF	.98	1.05	1.08	1.04	1.06	1.08	1.05	R= 7.01
VB/UINF	-.06	-.04	-.01	-.04	-.03	.02	-.00	UINF= 45.3 M/SEC
WB/UINF	.19	.05	-.01	-.03	-.08	-.10	-.16	X/D= 13.88
CP	-.28	-.24	-.23	-.11	-.16	-.14	-.06	Z/D= 13.95
CPT	-.27	-.17	-.05	-.03	-.02	.04	.07	PHI= 17.5 DEG
UB/UINF	1.00	.99	1.13	1.12	1.13	1.03	.98	R= 7.01
VB/UINF	-.05	-.04	.00	.00	-.02	.01	-.00	UINF= 45.3 M/SEC
WB/UINF	.15	.04	-.02	-.04	-.05	-.10	-.18	X/D= 13.88
CP	-.31	-.14	-.23	-.22	-.15	-.08	-.01	Z/D= 13.95
CPT	-.28	-.15	.06	.05	.13	-.01	-.02	PHI= 17.5 DEG

TABLF C1.- Continued

(d) R = 6. Concluded.

(e) R = 7.

TEST CONDITIONS	ZB/D								ZB/D							TEST CONDITIONS
	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 8.01	1.29	1.34	2.31	2.58	1.85	.76	.49	UB/UINF	.92	.91	.92	1.52	2.58	2.81	1.66	R= 8.03
UINF= 30.8 M/SEC	-.02	-.02	.16	.15	.14	.03	.11	VB/UINF	-.13	-.18	-.19	.10	.06	.08	.08	UINF= 38.4 M/SEC
X/D= 1.80	.80	.40	.13	.26	.20	-.11	-.42	WB/UINF	1.27	1.43	1.08	.55	.72	.70	.45	X/D= 2.00
Z/D= 7.95	-2.01	-1.79	-2.19	-1.73	-1.17	-.17	.41	CP	-2.54	-2.16	-1.95	-2.38	-2.59	-2.61	-1.39	Z/D= 6.75
PHI= 52.0 DEG	-.70	-.82	2.27	4.13	1.33	-.57	-.15	CPT	-1.05	-.23	-.88	-.74	3.79	5.03	.66	PHI= 44.7 DEG
R= 8.01	1.05	1.30	2.40	2.85	1.73	.83	.49	UB/UINF	.77	1.14	.92	1.34	2.70	2.72	1.63	R= 8.02
UINF= 30.9 M/SEC	.13	.17	.21	.15	.20	.02	.01	VB/UINF	-.12	-.16	.00	.05	.11	.13	.04	UINF= 38.4 M/SEC
X/D= 1.80	.90	.26	.11	.26	.22	-.02	-.47	WB/UINF	1.36	1.17	1.09	.58	.67	.77	.46	X/D= 2.00
Z/D= 7.95	-1.32	-1.80	-2.31	-2.41	-1.11	-.16	.44	CP	-1.74	-3.27	-2.09	-2.30	-2.62	-2.25	-1.19	Z/D= 6.75
PHI= 52.0 DEG	-.39	-1.02	2.60	4.97	.98	-.46	-.11	CPT	-.25	-1.56	-1.05	-1.16	4.33	5.00	.74	PHI= 44.7 DEG
R= 8.02	.83	.94	.89	1.53	2.73	2.71	1.54	UB/UINF	1.43	1.31	1.72	2.59	2.28	1.21	.45	R= 8.05
UINF= 30.8 M/SEC	-.02	-.23	.13	.19	.12	.13	.08	VB/UINF	-.01	-.02	.13	.07	.00	.08	.07	UINF= 38.6 M/SEC
X/D= 2.00	1.29	1.39	1.09	.51	.67	.78	.44	WB/UINF	.85	.56	.20	.18	.29	.04	-.46	X/D= 2.00
Z/D= 6.75	-1.94	-1.75	-1.76	-2.28	-2.94	-2.69	-1.02	CP	-2.11	-1.45	-1.67	-2.09	-1.56	-.56	.44	Z/D= 8.00
PHI= 44.7 DEG	-.58	-.05	-.76	-.63	4.12	4.42	.56	CPT	-.34	-.63	.40	3.79	2.78	-.08	-.14	PHI= 51.9 DEG
R= 8.01	.86	.92	.92	1.60	2.65	2.70	1.25	UB/UINF	1.41	1.16	1.92	2.63	2.18	1.10	.46	R= 8.06
UINF= 30.9 M/SEC	-.09	-.08	.03	.10	.16	.12	.11	VB/UINF	-.12	-.01	.01	.06	.02	.03	.05	UINF= 38.6 M/SEC
X/D= 2.00	1.33	1.41	1.11	.58	.66	.80	.39	WB/UINF	.86	.64	.21	.19	.26	-.01	-.39	X/D= 2.00
Z/D= 6.75	-1.84	-1.92	-1.85	-2.33	-3.08	-2.11	-.78	CP	-2.28	-1.64	-1.94	-2.22	-1.27	-.49	.35	Z/D= 8.00
PHI= 44.7 DEG	-.30	-.07	-.75	-.40	3.52	4.95	-.05	CPT	-.56	-.89	.86	3.89	2.61	-.27	-.29	PHI= 51.9 DEG
R= 8.04	1.06	.99	1.01	1.18	1.07	1.08	1.03	UB/UINF	1.15	1.22	1.76	2.50	2.40	1.39	.64	R= 8.03
UINF= 31.6 M/SEC	.03	.05	.00	-.02	-.01	-.03	.01	VB/UINF	.09	.10	.15	.10	.06	.09	.12	UINF= 38.4 M/SEC
X/D= 14.00	.24	.19	.07	.03	-.06	-.08	-.09	WB/UINF	.94	.70	.13	.19	.21	.03	-.26	X/D= 2.00
Z/D= 15.30	-.40	-.30	-.21	-.40	-.21	-.23	-.13	CP	-1.81	-1.55	-1.77	-1.83	-1.56	-.67	.11	Z/D= 8.00
PHI= 20.0 DEG	-.22	-.28	-.18	.00	-.06	-.05	-.06	CPT	-.48	-.55	.33	3.58	3.41	.29	-.34	PHI= 52.2 DEG
R= 8.05	.93	.91	1.13	1.07	1.17	1.04	1.04	UB/UINF	1.11	1.22	1.76	2.65	2.29	1.08	.52	R= 8.03
UINF= 31.6 M/SEC	.00	-.06	-.02	-.01	-.03	.00	.00	VB/UINF	-.13	.08	.11	.08	.11	.08	.04	UINF= 38.5 M/SEC
X/D= 14.00	.20	.23	.03	.03	-.03	-.11	-.13	WB/UINF	.91	.59	.23	.17	.24	.12	-.40	X/D= 2.00
Z/D= 15.30	-.34	-.26	-.41	-.24	-.29	-.22	-.18	CP	-1.89	-1.59	-2.03	-2.22	-1.56	-.43	.34	Z/D= 8.00
PHI= 20.0 DEG	-.43	-.39	-.12	-.10	.09	-.13	-.08	CPT	-.61	-.72	.17	4.02	2.88	-.23	-.23	PHI= 52.2 DEG
R= 8.06	1.05	.82	1.02	1.28	2.70	2.93	1.73	UB/UINF	1.30	1.10	1.26	1.82	2.03	1.73	1.18	R= 8.05
UINF= 38.3 M/SEC	-.03	-.07	-.16	-.14	-.05	.08	.05	VB/UINF	-.11	-.05	-.04	-.08	-.03	-.06	.02	UINF= 38.8 M/SEC
X/D= 2.03	1.27	1.50	1.04	.64	.60	.71	.47	WB/UINF	.72	.55	.21	.06	.09	.11	-.09	X/D= 3.69
Z/D= 6.75	-2.34	-1.66	-2.24	-1.93	-2.83	-2.56	-1.33	CP	-1.38	-1.10	-.94	-1.19	-1.10	-.57	-.27	Z/D= 9.41
PHI= 45.0 DEG	-.59	.29	-1.08	-.84	4.02	5.85	.93	CPT	-.13	-.57	-.30	1.16	2.07	1.47	.13	PHI= 41.9 DEG
R= 8.05	.94	1.12	.97	1.30	2.55	2.78	1.65	UB/UINF	1.26	1.12	1.08	1.74	1.88	1.52	.91	R= 8.03
UINF= 38.6 M/SEC	.09	-.09	-.28	-.06	.05	.05	.04	VB/UINF	-.07	-.05	-.07	-.01	-.08	-.06	-.04	UINF= 38.7 M/SEC
X/D= 2.03	1.30	1.27	1.13	.86	.61	.82	.42	WB/UINF	.70	.52	.24	.05	.12	.05	-.11	X/D= 3.69
Z/D= 6.75	-1.96	-2.83	-1.87	-2.03	-2.79	-2.15	-.97	CP	-1.52	-1.07	-.87	-.99	-.99	-.65	.01	Z/D= 9.41
PHI= 45.0 DEG	-.35	-.93	-.57	-.87	3.27	5.50	.96	CPT	-.43	-.54	-.64	1.08	1.60	.69	-.15	PHI= 41.9 DEG

TABLE C1.- Continued

(f) R = 8.

TEST CONDITIONS	ZB/D								ZB/D							TEST CONDITIONS
	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 8.04	.99	.96	1.25	1.72	1.71	1.47	.91	UB/UINF	.90	1.02	1.02	1.27	1.18	1.22	1.10	R= 8.04
UINF= 38.0 M/SEC	-.00	.02	-.08	.06	-.02	.07	.04	VB/UINF	.06	-.02	-.06	-.02	-.00	.01	.02	UINF= 39.3 M/SEC
X/D= 3.79	.61	.58	.27	.22	.29	.12	-.12	WB/UINF	.57	.25	.28	.07	.05	-.01	-.09	X/D= 9.96
Z/D= 9.97	-1.10	-.89	-.94	-.94	-.84	-.43	-.06	CP	-.43	-.45	-.34	-.39	-.25	-.22	-.17	Z/D= 13.50
PHI= 35.0 DEG	-.46	-.73	-.34	1.10	1.21	.76	-.20	CPT	-.28	-.35	-.22	.23	.16	.28	.04	PHI= 23.0 DEG
R= 8.04	.89	1.00	1.41	1.74	1.62	1.32	.99	UB/UINF	1.02	1.08	1.01	1.07	1.18	1.22	1.13	R= 8.03
UINF= 38.1 M/SEC	-.04	.05	.09	.05	.02	.07	.01	VB/UINF	-.00	-.08	.01	.01	.00	-.02	-.02	UINF= 39.3 M/SEC
X/D= 3.79	.85	.52	.24	.29	.25	.18	-.07	WB/UINF	.49	.35	.23	.07	-.04	-.00	-.01	X/D= 9.96
Z/D= 9.97	-.96	-.96	-1.04	-1.06	-1.04	-.40	-.12	CP	-.55	-.48	-.37	-.33	-.33	-.24	-.23	Z/D= 13.50
PHI= 35.0 DEG	-.38	-.68	.03	1.18	1.39	.40	-.14	CPT	-.25	-.19	-.30	-.17	.07	.27	.04	PHI= 23.0 DEG
R= 8.05	1.02	1.07	1.01	1.27	1.43	1.44	1.28	UB/UINF	1.07	1.08	1.06	.96	1.11	1.25	1.09	R= 8.05
UINF= 38.4 M/SEC	-.07	-.02	-.07	.03	.02	.06	.08	VB/UINF	-.00	-.05	.02	-.07	.01	-.02	.04	UINF= 38.9 M/SEC
X/D= 6.05	.71	.54	.39	.19	.11	.12	.00	WB/UINF	.44	.51	.32	.12	.10	.00	-.07	X/D= 11.98
Z/D= 11.00	-.65	-.68	-.24	-.35	-.31	-.21	-.09	CP	-.63	-.55	-.62	-.23	-.32	-.32	-.19	Z/D= 14.00
PHI= 30.0 DEG	-.09	-.04	-.05	.31	.76	.90	.56	CPT	-.28	-.12	-.28	-.29	-.06	.26	.00	PHI= 21.0 DEG
R= 8.08	1.13	1.09	1.09	1.19	1.57	1.55	1.36	UB/UINF	1.02	1.02	1.00	1.14	1.16	1.20	1.09	R= 8.06
UINF= 38.3 M/SEC	.03	-.02	.00	.07	.03	.07	.11	VB/UINF	.02	.01	-.04	.02	-.01	.01	-.01	UINF= 38.9 M/SEC
X/D= 6.05	.67	.51	.31	.22	.15	.11	.02	WB/UINF	.55	.47	.34	.15	.06	.00	-.08	X/D= 11.98
Z/D= 11.00	-.72	-.59	-.32	-.35	-.53	-.31	-.31	CP	-.70	-.49	-.36	-.41	-.38	-.26	-.16	Z/D= 14.00
PHI= 30.0 DEG	.02	-.14	-.03	.12	1.00	1.15	.51	CPT	-.35	-.23	-.23	-.07	-.03	.18	.04	PHI= 21.0 DEG
R= 8.04	1.15	1.01	1.04	1.13	1.46	1.40	1.09	UB/UINF	1.03	1.00	.99	1.05	1.14	1.16	1.07	R= 8.07
UINF= 38.9 M/SEC	.05	-.01	.03	.04	.04	.01	-.01	VB/UINF	-.01	-.04	-.04	-.08	-.01	.01	-.03	UINF= 39.4 M/SEC
X/D= 6.53	.56	.48	.24	.11	.05	.03	-.04	WB/UINF	.31	.28	.03	.01	.01	-.03	-.09	X/D= 14.00
Z/D= 11.35	-.94	-.86	-.60	-.45	-.45	-.38	-.04	CP	-.48	-.29	-.33	-.28	-.28	-.25	-.19	Z/D= 15.30
PHI= 30.0 DEG	-.29	-.41	-.45	-.15	.69	.59	.14	CPT	-.32	-.20	-.34	-.18	.02	.11	-.03	PHI= 20.0 DEG
R= 8.01	1.09	.93	1.07	1.34	1.41	1.49	1.23	UB/UINF	.95	1.06	1.06	1.11	1.11	1.03	1.08	R= 8.02
UINF= 38.7 M/SEC	-.05	.04	-.01	.01	-.03	-.04	-.02	VB/UINF	-.04	-.05	-.04	-.00	-.03	-.01	.03	UINF= 39.4 M/SEC
X/D= 6.53	.58	.48	.28	.09	-.01	.01	-.05	WB/UINF	.29	.23	.10	.04	-.03	-.08	-.12	X/D= 14.00
Z/D= 11.35	-.87	-.69	-.64	-.54	-.52	-.46	-.17	CP	-.42	-.44	-.35	-.29	-.23	-.17	-.23	Z/D= 15.30
PHI= 30.0 DEG	-.33	-.38	-.41	.27	.50	.77	.36	CPT	-.43	-.25	-.21	-.05	.02	-.10	-.03	PHI= 20.0 DEG
R= 8.05	1.02	1.06	1.07	1.23	1.42	1.25	1.24	UB/UINF	1.05	.86	1.01	1.00	1.07	1.09	1.07	R= 8.04
UINF= 39.0 M/SEC	-.07	-.05	-.02	.02	-.03	.04	.01	VB/UINF	.01	-.04	-.01	-.01	-.02	.02	-.00	UINF= 39.0 M/SEC
X/D= 7.69	.54	.33	.18	.10	.07	.05	-.04	WB/UINF	.26	.18	.13	.00	-.02	-.07	-.08	X/D= 18.14
Z/D= 12.49	-.69	-.68	-.53	-.46	-.49	-.38	-.26	CP	-.28	-.13	-.13	-.11	-.04	-.07	-.05	Z/D= 16.50
PHI= 26.0 DEG	-.35	-.45	-.36	.06	.54	.20	.30	CPT	-.11	-.35	-.08	-.10	.12	.13	.10	PHI= 18.0 DEG
R= 8.05	1.08	.93	1.08	1.22	1.36	1.24	1.21	UB/UINF	1.03	1.03	.95	.96	1.11	1.09	1.06	R= 8.04
UINF= 39.0 M/SEC	-.04	-.10	-.05	-.01	-.04	.02	-.00	VB/UINF	-.06	-.03	-.06	-.07	-.03	-.04	-.01	UINF= 39.0 M/SEC
X/D= 7.69	.62	.43	.22	.12	.08	-.01	-.06	WB/UINF	.31	.15	.14	-.01	.02	-.05	-.11	X/D= 18.14
Z/D= 12.49	-.67	-.36	-.55	-.52	-.41	-.29	-.35	CP	-.32	-.21	-.04	-.04	-.16	-.08	-.07	Z/D= 16.50
PHI= 26.0 DEG	-.11	-.31	-.32	-.00	.42	.25	.13	CPT	-.16	-.11	-.10	-.11	.08	.12	.08	PHI= 18.0 DEG

TABLE C1.- Continued

(f) R = 8. Concluded.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 10.03	1.86	1.60	2.28	3.12	2.97	2.08	.96	UB/UINF	1.15	1.14	1.26	1.41	1.69	1.85	1.56	R= 9.99
UINF= 24.5 M/SEC	.07	.12	.24	.25	.21	.23	.00	VB/UINF	-.11	.06	.05	.11	.00	.09	.11	UINF= 30.6 M/SEC
X/D= 2.00	.52	.42	.16	.20	.33	.36	-.12	WB/UINF	.55	.44	.26	.17	.16	.17	.05	X/D= 6.06
Z/D= 9.50	-2.75	-2.65	-2.80	-3.28	-2.51	-1.96	-.57	CP	-1.20	-1.07	-.77	-1.00	-1.01	-.86	-.87	Z/D= 13.50
PHI= 57.4 DEG	-.01	-.88	1.54	5.66	5.60	1.56	-.66	CPT	-.55	-.57	-.12	.04	.91	1.64	.60	PHI= 34.8 DEG
R= 10.03	1.51	1.67	2.03	3.02	3.02	1.95	1.10	UB/UINF	1.06	1.15	1.23	1.40	1.84	1.70	1.59	R= 10.00
UINF= 24.5 M/SEC	.08	.15	.12	.21	.14	.15	.17	VB/UINF	-.02	.07	.07	.02	.19	.04	.16	UINF= 30.7 M/SEC
X/D= 2.00	.72	.50	.08	.14	.29	.24	.00	WB/UINF	.58	.48	.32	.16	.13	.11	.05	X/D= 6.06
Z/D= 9.50	-2.53	-2.41	-2.57	-2.85	-2.77	-1.51	-.97	CP	-1.13	-.94	-.89	-.82	-1.23	-.98	-.86	Z/D= 13.50
PHI= 57.4 DEG	-.73	-.33	.60	5.48	5.59	1.38	-.73	CPT	-.68	-.37	-.28	.18	1.24	.95	.71	PHI= 34.8 DEG
R= 10.06	1.03	.97	1.18	1.19	1.17	1.21	1.04	UB/UINF	1.10	1.04	.98	1.28	1.45	1.59	1.44	R= 9.99
UINF= 25.2 M/SEC	.05	.06	.08	.08	.13	.11	.02	VB/UINF	.15	.01	.08	.02	.04	.03	.05	UINF= 31.3 M/SEC
X/D= 14.03	.32	.19	.11	.02	-.01	-.01	-.15	WB/UINF	.54	.51	.45	.18	.05	.10	.04	X/D= 7.99
Z/D= 17.50	-.60	-.47	-.51	-.48	-.34	-.36	-.02	CP	-1.14	-.70	-.42	-.70	-.57	-.61	-.55	Z/D= 14.50
PHI= 25.0 DEG	-.43	-.49	-.09	-.03	.04	.13	.09	CPT	-.61	-.36	-.24	-.03	.56	.93	.53	PHI= 31.0 DEG
R= 10.07	.97	1.01	1.04	1.17	1.31	1.16	1.45	UB/UINF	1.12	1.03	1.09	1.20	1.61	1.54	1.47	R= 9.99
UINF= 25.2 M/SEC	-.11	.08	.13	.10	.04	.13	.05	VB/UINF	-.02	-.03	-.05	.04	.05	.07	.04	UINF= 31.3 M/SEC
X/D= 14.03	.26	.16	.13	.00	-.04	.01	-.13	WB/UINF	.55	.52	.30	.16	.09	.08	.03	X/D= 7.99
Z/D= 17.50	-.43	-.56	-.40	-.45	-.47	-.25	-.60	CP	-.94	-.66	-.64	-.59	-.73	-.60	-.52	Z/D= 14.50
PHI= 25.0 DEG	-.40	-.51	-.29	-.08	.26	.11	.51	CPT	-.36	-.33	-.35	-.12	.87	.81	.65	PHI= 31.0 DEG
R= 9.99	1.61	1.27	2.06	2.88	3.04	1.69	.85	UB/UINF	1.08	1.11	1.11	.97	1.24	1.33	1.44	R= 9.98
UINF= 30.8 M/SEC	.18	.15	.21	.24	.18	.15	.08	VB/UINF	-.04	.03	.01	.11	.11	.03	.07	UINF= 31.4 M/SEC
X/D= 2.00	.76	.73	.17	.12	.30	.32	.08	WB/UINF	.59	.46	.26	.25	.14	.08	-.03	X/D= 10.16
Z/D= 9.50	-2.46	-1.82	-2.61	-3.01	-2.34	-1.43	-.46	CP	-.85	-.74	-.75	-.37	-.59	-.56	-.65	Z/D= 15.47
PHI= 57.4 DEG	-.24	-.64	.76	4.49	6.20	.57	-.73	CPT	-.32	-.30	-.45	-.36	-.01	.23	.45	PHI= 28.0 DEG
R= 9.99	1.39	1.40	1.95	3.03	3.13	1.76	1.18	UB/UINF	1.04	1.05	1.06	1.13	1.14	1.39	1.44	R= 9.98
UINF= 30.6 M/SEC	.05	.10	.16	.24	.25	.17	.19	VB/UINF	.03	-.06	.06	.07	.04	.05	-.01	UINF= 31.4 M/SEC
X/D= 2.00	.90	.55	.23	.11	.27	.29	.03	WB/UINF	.57	.40	.31	.18	.08	.04	.02	X/D= 10.16
Z/D= 9.50	-2.08	-2.05	-2.18	-3.00	-3.01	-1.18	-.88	CP	-.92	-.74	-.59	-.53	-.45	-.50	-.61	Z/D= 15.47
PHI= 57.4 DEG	-.33	-.77	.74	5.47	6.14	1.03	-.43	CPT	-.51	-.48	-.37	-.22	-.13	.45	.48	PHI= 28.0 DEG
R= 9.98	1.44	1.36	1.50	1.89	2.20	2.15	1.62	UB/UINF	1.01	.88	.97	1.15	1.30	1.19	1.40	R= 9.97
UINF= 30.5 M/SEC	-.07	.09	-.04	.07	.03	.12	-.03	VB/UINF	-.02	-.06	.02	.04	.09	.08	.02	UINF= 31.3 M/SEC
X/D= 4.00	.77	.68	.42	.31	.33	.31	.32	WB/UINF	.53	.39	.27	.16	.03	.01	-.02	X/D= 12.11
Z/D= 11.48	-1.93	-1.48	-1.49	-1.88	-1.80	-1.32	-.99	CP	-.55	-.49	-.40	-.47	-.42	-.29	-.45	Z/D= 16.50
PHI= 41.0 DEG	-.23	-.15	-.08	1.01	2.42	2.45	.77	CPT	-.25	-.56	-.39	-.12	.28	.15	.53	PHI= 25.0 DEG
R= 9.98	1.38	1.07	1.42	1.74	2.21	2.24	1.69	UB/UINF	.93	.94	1.08	1.20	1.18	1.31	1.33	R= 9.98
UINF= 30.8 M/SEC	-.11	.02	.01	.07	.03	.09	.09	VB/UINF	.03	.07	.03	.08	.11	.03	.02	UINF= 31.3 M/SEC
X/D= 4.00	.72	.74	.60	.36	.30	.35	.14	WB/UINF	.65	.51	.20	.12	.04	.01	-.07	X/D= 12.11
Z/D= 11.48	-2.14	-1.23	-1.67	-1.51	-1.45	-1.56	-1.16	CP	-.43	-.51	-.53	-.45	-.30	-.36	-.46	Z/D= 16.50
PHI= 41.0 DEG	-.71	-.53	-.46	.67	2.57	2.66	.76	CPT	-.15	-.35	-.32	.01	.11	.36	.30	PHI= 25.0 DEG

TABLE C1.- Continued

(g) R = 10.

TEST CONDITIONS	ZP/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 9.99	1.00	1.14	.98	1.05	1.11	1.10	1.22	UB/UINF
UINF= 31.6 M/SEC	.06	.10	.01	.07	-.04	.01	-.01	VB/UINF
X/D= 14.03	.44	.24	.20	.07	.01	-.05	-.11	WB/UINF
Z/D= 17.50	-.53	-.64	-.29	-.32	-.30	-.21	-.40	CP
PHI= 25.0 DEG	-.33	-.26	-.29	-.20	-.07	.01	.10	CPT
R= 10.00	1.07	.98	.96	1.09	1.17	1.18	1.21	UB/UINF
UINF= 31.7 M/SEC	-.04	.02	-.01	.02	.04	.01	.04	VB/UINF
X/D= 14.03	.37	.38	.20	.12	.04	-.06	-.09	WB/UINF
Z/D= 17.50	-.59	-.27	-.33	-.24	-.44	-.43	-.28	CP
PHI= 25.0 DEG	-.31	-.35	-.36	-.03	-.07	-.03	.19	CPT

TABLE C1.- Concluded

(g) R = 10. Concluded.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 3.20	.78	.53	.49	.42	.32	1.93*	1.38*	UB/UINF	.74	.62	.45	.30	.31	1.87*	1.64*	R= 3.18
UINF= 33.5 M/SEC	.16	.01	-.09	.03	-.01	.12	.05	VB/UINF	.16	.07	-.04	-.12	.03	.11	.06	UINF= 51.3 M/SEC
X/D= 2.00	.14	.80	1.03	.64	.30	.32	.42	WB/UINF	.13	.69	.94	.55	.20	.30	.33	X/D= 2.00
Z/D= 2.00	-.42	-.49	-.82	-1.35	-1.08	-1.77	-.57	CP	-.44	-.85	-.95	-1.38	-1.26	-1.74	-.76	Z/D= 2.00
PHI= 22.0 DEG	-.76	-.58	-.50	-1.76	-1.88	1.10	.52	CPT	-.84	-.98	-.85	-1.97	-2.12	.94	1.07	PHI= 22.0 DEG
R= 3.17	.66	.52	.57	.30	.20	1.97*	1.45*	UB/UINF	.66	.61	.43	.21$	.16	1.91*	1.39*	R= 3.14
UINF= 33.5 M/SEC	.04	-.02	.09	.00	-.13	.10	.08	VB/UINF	.14	.07	-.17	.13	-.17	.07	.09	UINF= 51.2 M/SEC
X/D= 2.00	.17	.80	.41	.59	.39	.31	.46	WB/UINF	.17	.67	.78	.71	.24	.32	.36	X/D= 2.00
Z/D= 2.00	-.32	-.40	-1.49	-1.33	-.94	-1.91	-.52	CP	-.47	-.71	-1.25	-1.00	-1.15	-1.65	-.46	Z/D= 2.00
PHI= 22.0 DEG	-.85	-.48	-1.51	-1.89	-1.73	1.12	.82	CPT	-.98	-.88	-1.42	-1.43	-2.04	1.21	.64	PHI= 22.0 DEG
R= 3.23	.81	.98	.77	.68	.52	.69	1.03	UB/UINF	.87	.66	.67	.57	.34	.67	1.46*	R= 3.17
UINF= 34.4 M/SEC	.02	.12	.01	-.05	-.01	.04	.00	VB/UINF	.10	.12	.04	-.02	-.05	-.04	.05	UINF= 51.6 M/SEC
X/D= 6.00	.13	.23	.40	.35	.28	.15	-.06	WB/UINF	.04	.36	.65	.48	.37	.04	-.03	X/D= 4.00
Z/D= 3.00	-.10	-.39	-.42	-.49	-.34	-.36	-.41	CP	-.24	-.35	-.44	-.81	-.56	-.66	-.92	Z/D= 2.50
PHI= 12.9 DEG	-.43	-.36	-.66	-.89	-1.00	-.86	-.35	CPT	-.46	-.76	-.57	-1.25	-1.31	-1.20	.25	PHI= 16.0 DEG
R= 3.20	.77	.84	.77	.73	.63	.67	.99	UB/UINF	.87	.76	.73	.52	.33	.52	1.36*	R= 3.15
UINF= 34.4 M/SEC	.11	.06	.00	-.03	-.02	-.02	.04	VB/UINF	.17	.05	.00	.02	-.04	-.03	.03	UINF= 51.7 M/SEC
X/D= 6.00	.13	.22	.44	.38	.24	.14	-.04	WB/UINF	.09	.37	.51	.57	.44	.14	-.03	X/D= 4.00
Z/D= 3.00	-.10	-.30	-.26	-.47	-.42	-.35	-.41	CF	-.27	-.30	-.60	-.73	-.56	-.55	-.74	Z/D= 2.50
PHI= 12.9 DEG	-.48	-.55	-.47	-.79	-.96	-.88	-.43	CPT	-.48	-.58	-.80	-1.14	-1.26	-1.26	.12	PHI= 16.0 DEG
R= 3.16	.90	.93	.85	.77	.75	.71	.67	UB/UINF	.89	.87	.78	.63	.41	.71	1.08	R= 3.19
UINF= 34.4 M/SEC	.05	.02	.05	.02	.01	-.01	-.04	VB/UINF	.08	.05	.06	-.00	-.03	-.04	-.01	UINF= 52.5 M/SEC
X/D= 8.00	-.02	.09	.25	.35	.28	.24	.10	WB/UINF	.06	.27	.33	.38	.25	.09	-.04	X/D= 6.00
Z/D= 3.00	-.21	-.16	-.13	-.17	-.28	-.31	-.21	CP	-.17	-.28	-.42	-.38	-.35	-.45	-.44	Z/D= 3.00
PHI= 13.0 DEG	-.40	-.30	-.34	-.45	-.63	-.74	-.75	CPT	-.37	-.44	-.69	-.83	-1.11	-.94	-.25	PHI= 12.9 DEG
R= 3.14	.98	1.01	.90	.74	.76	.68	.88	UB/UINF	.88	.82	.81	.67	.59	.65	1.00	R= 3.17
UINF= 34.5 M/SEC	.07	.01	.02	.04	-.00	-.01	.01	VB/UINF	.08	.08	.05	-.08	.00	-.08	-.02	UINF= 52.7 M/SEC
X/D= 8.00	-.02	.04	.22	.34	.20	.10	.00	WB/UINF	.12	.28	.35	.31	.24	.03	-.05	X/D= 6.00
Z/D= 3.00	-.12	-.26	-.16	-.17	-.31	-.24	-.37	CP	-.20	-.24	-.33	-.47	-.39	-.36	-.37	Z/D= 3.00
PHI= 13.0 DEG	-.16	-.23	-.29	-.51	-.70	-.76	-.59	CPT	-.39	-.48	-.54	-.93	-.99	-.93	-.36	PHI= 12.9 DEG
R= 3.21	.95	.90	.87*	.85	.81	.90	.94	UB/UINF	.91	.88	.84	.75	.73	.66	.78	R= 3.15
UINF= 34.4 M/SEC	.09	.12	.01	.06	-.00	-.02	.03	VB/UINF	.08	.07	-.01	-.01	-.04	-.02	-.01	UINF= 52.8 M/SEC
X/D= 14.00	.13	.14	.07	.12	.05	.01	-.02	WB/UINF	-.00	.11	.21	.37	.22	.11	.01	X/D= 8.00
Z/D= 4.50	-.20	-.10	-.21	-.23	-.16	-.20	-.20	CP	-.12	-.11	-.18	-.17	-.22	-.26	-.26	Z/D= 3.00
PHI= 8.0 DEG	-.26	-.25	-.44	-.48	-.50	-.39	-.30	CPT	-.29	-.31	-.43	-.46	-.64	-.81	-.65	PHI= 13.0 DEG
R= 3.20	.97	.81	.89	.79	.89	.93	.95	UB/UINF	.92	.90	.92	.74	.73	.65	.85*	R= 3.19
UINF= 34.5 M/SEC	.06	.12	.02	-.04	.02	.03	.00	VB/UINF	.07	.08	.05	.06	-.01	-.02	.00	UINF= 52.5 M/SEC
X/D= 14.00	.11	.16	.13	.11	.07	.03	-.08	WB/UINF	-.03	.05	.22	.27	.25	.14	.06	X/D= 8.00
Z/D= 4.50	-.23	-.06	-.25	-.20	-.27	-.20	-.17	CP	-.14	-.21	-.23	-.21	-.26	-.26	-.32	Z/D= 3.00
PHI= 8.0 DEG	-.26	-.37	-.44	-.56	-.48	-.34	-.27	CPT	-.28	-.39	-.32	-.58	-.66	-.82	-.60	PHI= 13.0 DEG

TABLE C2.- SYMMETRY PLANE VELOCITIES AND PRESSURES, VORTEX CURVE

(a) R = 3.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 3.16	.85	.87	.79	.76	.68	.79	.94	UB/UINF
UINF= 52.8 M/SEC	.05	.06	-.01	-.02	-.05	-.00	-.00	VB/UINF
X/D= 8.00	.13	.20	.25	.21	.21	.05	-.07	WB/UINF
Z/D= 3.48	-.13	-.24	-.28	-.34	-.26	-.29	-.24	CP
PHI= 11.0 DEG	-.38	-.44	-.60	-.72	-.75	-.66	-.35	CPT
R= 3.16	.82	.91	.87	.76	.71	.71	1.07	UB/UINF
UINF= 52.9 M/SEC	.07	.02	.01	.01	-.02	-.02	.00	VB/UINF
X/D= 8.00	.13	.22	.32	.30	.23	.03	-.07	WB/UINF
Z/D= 3.48	-.09	-.24	-.29	-.31	-.26	-.23	-.35	CP
PHI= 11.0 DEG	-.39	-.37	-.43	-.64	-.70	-.73	-.20	CPT
R= 3.18	.94	.91	.85	.78	.74	.82	.91	UB/UINF
UINF= 53.3 M/SEC	.04	.08	.01	.01	-.02	.01	.00	VB/UINF
X/D= 9.48	.11	.20	.24	.23	.08	.04	-.05	WB/UINF
Z/D= 3.75	-.20	-.21	-.26	-.26	-.24	-.22	-.19	CP
PHI= 10.0 DEG	-.31	-.33	-.48	-.60	-.69	-.54	-.36	CPT
R= 3.18	.94	.83	.82	.76	.75	.86	.86	UB/UINF
UINF= 53.1 M/SEC	.05	.05	.01	-.03	-.02	-.00	.01	VB/UINF
X/D= 9.48	.13	.23	.25	.23	.15	.01	-.04	WB/UINF
Z/D= 3.75	-.16	-.11	-.19	-.17	-.17	-.22	-.13	CP
PHI= 10.0 DEG	-.24	-.36	-.46	-.53	-.58	-.48	-.39	CPT
R= 3.17	.97	.86	.85	.83	.75	.84	.90	UB/UINF
UINF= 53.0 M/SEC	.05	.05	.02	-.02	-.01	-.01	-.01	VB/UINF
X/D= 12.00	.06	.17	.18	.23	.13	-.02	-.05	WB/UINF
Z/D= 4.00	-.15	-.11	-.17	-.16	-.16	-.16	-.19	CP
PHI= 9.0 DEG	-.21	-.33	-.41	-.41	-.57	-.45	-.36	CPT
R= 3.17	.93	.94	.88	.83	.79	.81	.89	UB/UINF
UINF= 53.0 M/SEC	.05	.03	.01	.01	-.03	-.02	-.01	VB/UINF
X/D= 12.00	.07	.12	.14	.19	.08	.04	-.04	WB/UINF
Z/D= 4.00	-.14	-.20	-.21	-.17	-.14	-.18	-.15	CP
PHI= 9.0 DEG	-.26	-.30	-.40	-.44	-.50	-.52	-.36	CPT
R= 3.17	.90	.85	.86	.84	.79*	.83	.95	UB/UINF
UINF= 52.6 M/SEC	.04	.02	-.03	-.02	-.01	-.03	-.01	VB/UINF
X/D= 14.00	.12	.14	.19	.13	-.00	.00	-.04	WB/UINF
Z/D= 4.50	-.13	-.11	-.19	-.20	-.12	-.13	-.18	CP
PHI= 8.0 DEG	-.31	-.37	-.40	-.47	-.49	-.44	-.27	CPT
R= 3.18	1.00	.90*	.88	.86	.80	.89	.95	UB/UINF
UINF= 52.7 M/SEC	.05	.01	.01	-.02	-.03	-.00	.01	VB/UINF
X/D= 14.00	.09	.09	.15	.12	.11	.04	-.06	WB/UINF
Z/D= 4.50	-.22	-.20	-.20	-.20	-.14	-.17	-.18	CP
PHI= 8.0 DEG	-.21	-.37	-.40	-.44	-.49	-.37	-.28	CPT

	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
UB/UINF	.93	.88	.86	.90	.90	.93	1.00	R= 3.17
VB/UINF	.02	.03	.00	-.03	-.03	.02	.01	UINF= 51.8 M/SEC
WB/UINF	.07	.09	.11	.06	.03	-.02	-.07	X/D= 18.00
CP	-.09	-.13	-.13	-.12	-.13	-.12	-.13	Z/D= 5.00
CPT	-.22	-.35	-.38	-.30	-.31	-.25	-.11	PHI= 7.1 DEG
UB/UINF	.93	.95	.88	.86	.88	.89	1.01*	R= 3.16
VB/UINF	.02	.01	-.03	-.03	-.02	-.00	-.01	UINF= 51.9 M/SEC
WB/UINF	.07	.08	.09	.06	.02	-.04	-.03	X/D= 18.00
CP	-.13	-.15	-.12	-.12	-.11	-.07	-.16	Z/D= 5.00
CPT	-.25	-.23	-.34	-.37	-.34	-.27	-.13	PHI= 7.1 DEG
UB/UINF	.95	.90*	.89	.89	.92	.98	.97	R= 3.15
VB/UINF	.03	.02	-.01	-.01	.00	-.03	-.01	UINF= 52.2 M/SEC
WB/UINF	-.03	-.06	-.04	-.05	-.07	-.09	-.13	X/D= 25.00
CP	-.11	-.08	-.08	-.08	-.10	-.10	-.08	Z/D= 6.00
CPT	-.20	-.27	-.28	-.28	-.25	-.13	-.12	PHI= 10.0 DEG
UB/UINF	.97	.96	.91	.90	.89	.94	1.02*	R= 3.15
VB/UINF	.01	.01	.00	-.03	-.01	-.01	.00	UINF= 52.2 M/SEC
WB/UINF	-.04	-.01	-.06	-.03	-.06	-.12	-.11	X/D= 25.00
CP	-.15	-.16	-.10	-.12	-.06	-.09	-.11	Z/D= 6.00
CPT	-.20	-.23	-.27	-.31	-.26	-.18	-.06	PHI= 10.0 DEG

TABLE C2.- Continued

(a) R = 3. Concluded.

TEST CONDITIONS	ZB/D								ZB/D							TEST CONDITIONS
	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 4.13	.89	.67	.32	.36	.22	1.39	2.38*	UB/UINF	.11$	.49	.60	.37	.59	.54	1.09*	R= 4.14
UINF= 25.0 M/SEC	.08	-.10	-.09	-.11	.11	.13	.11	VB/UINF	-.40	.09	-.01	.00	-.01	-.03	.03	UINF= 38.5 M/SEC
X/D= 2.03	.00	.36	.74	.73	.50	.09	.66	WB/UINF	[illegible]	.31	.66	.69	.37	.05	-.01	X/D= 4.00
Z/D= 2.50	-1.07	-1.35	-1.49	-1.81	-1.39	-2.07	-2.13	CP	[illegible]	-.76	-.57	-.53	-1.05	-.88	-.88	Z/D= 3.25
PHI= 28.0 DEG	-1.26	-1.76	-1.83	-2.15	-2.09	-1.11	3.03	CPT	-1.04	-1.42	-.78	-.91	-1.56	-1.59	-.68	PHI= 20.0 DEG
R= 4.13	.95	.80	.31	.29$	.34	1.22	2.53*	UB/UINF	.67	.75	.58	.49	.46	.60	1.27*	R= 4.13
UINF= 25.0 M/SEC	-.03	-.19	-.06	-.35	.11	.13	.18	VB/UINF	.08	.02	.07	-.05	-.02	-.04	.04	UINF= 38.6 M/SEC
X/D= 2.03	.12	.52	.79	.77	.41	.18	.65	WB/UINF	-.05	.24	.52	.52	.49	.17	-.03	X/D= 4.00
Z/D= 2.50	-1.16	-1.26	-1.38	-1.44	-1.44	-2.13	-2.57	CP	-.87	-.85	-.73	-.88	-.86	-.84	-1.00	Z/D= 3.25
PHI= 28.0 DEG	-1.24	-1.33	-1.65	-1.65	-2.14	-1.60	3.37	CPT	-1.42	-1.21	-1.12	-1.37	-1.42	-1.45	-.39	PHI= 20.0 DEG
R= 4.21	.54	.63	.68	.70	.59	.79	1.14*	UB/UINF	.77	.59	.60	.52	.75	.56	.42	R= 4.00
UINF= 25.2 M/SEC	.08	-.00	.05	-.05	.07	-.00	.09	VB/UINF	-.08	.07	.04	.03	.11	.05	-.02	UINF= 38.7 M/SEC
X/D= 6.00	.05	.40	.33	.40	.30	.08	.00	WB/UINF	-.40	-.24	-.12	.15	.33	.52	.52	X/D= 4.16
Z/D= 4.00	-.38	-.29	-.52	-.53	-.50	-.54	-.57	CP	-.48	-.60	-.64	-.65	-.78	-.81	-.74	Z/D= 2.03
PHI= 17.0 DEG	-1.08	-.73	-.94	-.88	-1.06	-.91	-.25	CPT	-.73	-1.19	-1.27	-1.36	-1.09	-1.23	-1.29	PHI= 31.8 DEG
R= 4.23	.41	.70	.51	.59*	.66	1.01	1.01*	UB/UINF	.31	.72	.78	.69	.74	.53	.50	R= 4.01
UINF= 25.1 M/SEC	-.06	.01	.09	.03	.01	.00	.06	VB/UINF	-.10	.08	.12	.05	.04	.09	-.02	UINF= 38.7 M/SEC
X/D= 6.00	.19	.18	.40	.27	.31	.06	-.01	WB/UINF	-.58	-.29	-.14	.18	.32	.63	.45	X/D= 4.16
Z/D= 4.00	-.34	-.54	-.40	-.50	-.46	.65	-.47	CP	.03	-.63	-.64	-.63	-.76	-.59	-.89	Z/D= 2.03
PHI= 17.0 DEG	-1.14	-1.02	-.98	-1.08	-.92	-.63	-.43	CPT	-.53	-1.03	-1.00	-1.12	-1.11	-.90	-1.43	PHI= 31.8 DEG
R= 4.19	.59*	.91	.77*	.81	.88	.96	1.06	UB/UINF	.65	.81	.61	.60	.64	.76	.91	R= 4.20
UINF= 25.8 M/SEC	.01	.01	.04	.00	.04	.02	.04	VB/UINF	.06	.10	.05	.02	-.00	-.03	-.01	UINF= 38.4 M/SEC
X/D= 14.00	.10	.05	-.05	.00	-.02	.01	-.10	WB/UINF	.10	.20	.26	.43	.24	.08	-.06	X/D= 6.00
Z/D= 6.00	-.03	-.21	-.19	-.20	-.21	-.18	-.20	CP	-.54	-.57	-.47	-.43	-.57	-.54	-.43	Z/D= 4.00
PHI= 10.5 DEG	-.67	-.39	-.59	-.54	-.43	-.26	-.06	CPT	-1.11	-.86	-1.02	-.89	-1.09	-.96	-.59	PHI= 17.0 DEG
R= 4.16	.87	.82	.88	.78	.79	.95	1.01	UB/UINF	.76	.77	.70	.62	.61	.80	1.06	R= 4.18
UINF= 25.9 M/SEC	.03	-.05	.06	-.01	-.03	.06	.02	VB/UINF	.03	.10	.15	-.01	-.07	.01	-.01	UINF= 38.4 M/SEC
X/D= 14.00	-.05	.03	.00	.01	.02	-.03	-.16	WB/UINF	.07	.13	.31	.35	.21	.11	-.06	X/D= 6.00
Z/D= 6.00	-.22	-.24	-.26	-.16	-.07	-.19	-.11	CP	-.62	-.65	-.59	-.46	-.58	-.60	-.64	Z/D= 4.00
PHI= 10.5 DEG	-.47	-.57	-.48	-.56	-.44	-.28	-.07	CPT	-1.03	-1.04	-.98	-.96	-1.16	-.95	-.51	PHI= 17.0 DEG
R= 4.13	.77	.66	.45	.25$	.21$	1.30	2.49*	UB/UINF	.85	.77	.81	.65	.67	.95	1.14	R= 4.01
UINF= 38.3 M/SEC	.01	.13	-.07	.01	-.01	.07	.11	VB/UINF	.04	.02	-.00	.01	-.02	.03	.02	UINF= 39.5 M/SEC
X/D= 2.03	.18	.47	.89	.81	.78	.21	.61	WB/UINF	.02	.16	.19	.20	.11	-.01	-.08	X/D= 8.00
Z/D= 2.50	-1.29	-1.56	-1.50	-1.76	-.99	-2.16	-2.40	CP	-.46	-.41	-.45	-.40	-.37	-.46	-.42	Z/D= 4.50
PHI= 28.0 DEG	-1.67	-1.88	-1.50	-2.04	-1.34	-1.41	3.34	CPT	-.75	-.79	-.76	-.94	-.90	-.56	-.11	PHI= 14.0 DEG
R= 4.14	.49	.61	.49	.41	.16$	1.04	2.38*	UB/UINF	.70	.59	.75	.64*	.65	.82	1.00*	R= 4.14
UINF= 38.2 M/SEC	.19	.07	-.03	-.13	-.10	.05	.06	VB/UINF	.03	.03	-.07	-.03	.01	-.04	-.00	UINF= 39.6 M/SEC
X/D= 2.03	.06	.58	.83	.80	.65	.22	.63	WB/UINF	.10	.17	.20	.12	[illegible]	.06	.00	X/D= 8.00
Z/D= 2.50	-1.12	-1.23	-1.67	-1.86	-1.17	-1.93	-2.18	CP	-.37	-.33	-.44	-.45	-.43	-.40	-.45	Z/D= 4.50
PHI= 28.0 DEG	-1.84	-1.51	-1.75	-2.04	-1.70	-1.79	3.02	CPT	-.87	-.96	-.83	-1.03	-.99	-.72	-.44	PHI= 14.0 DEG

TABLE C2.- Continued.

(b) R = 4.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 4.16	.74	.79	.69	.74	.76	.90	1.00	UB/UINF	.91	.92	.92	.94	.91	.90*	[illegible]	R= 4.13
UINF= 39.7 M/SEC	.06	.07	.06	.01	-.05	.00	.05	VB/UINF	.03	.02	.01	.03	-.00	.01	.02	UINF= 39.0 M/SEC
X/D= 9.10	.02	.10	.12	.13	.13	.06	-.06	WB/UINF	-.08	-.09	-.08	-.10	-.12	-.16	-.16	X/D= 25.01
Z/D= 4.75	-.48	-.35	[illegible]	-.44	-.43	-.43	-.42	CP	-.14	-.14	-.14	-.13	-.05	-.03	-.04	Z/D= 7.50
PHI= 13.0 DEG	-.92	-.71	-.93	[illegible]	-.83	-.62	-.40	CPT	-.31	-.28	-.28	-.23	-.23	-.19	-.09	PHI= 10.0 DEG
R= 4.17	.73	.76	.77	.68	[illegible]	.88	1.07	UB/UINF	.84	.85*	.90	.87*	.98	1.04	1.03	R= 4.12
UINF= 39.7 M/SEC	.01	.02	-.02	-.03	-.02	.01	.02	VB/UINF	.05	.02	-.00	.01	.02	.02	.02	UINF= 38.9 M/SEC
X/D= 9.[illegible]	.10	.13	.13	.22	.12	.05	-.05	WB/UINF	-.07	-.11	-.09	-.14	-.14	-.10	-.14	X/D= 25.01
Z/D= 4.75	-.39	-.44	-.42	-.41	-.39	-.43	-.45	CP	-.09	-.10	-.13	-.03	-.10	-.16	-.12	Z/D= 7.50
PHI= 13.0 DEG	-.85	-.85	-.80	-.89	-.84	-.66	-.29	CPT	-.38	-.36	-.31	-.25	-.11	.00	-.36	PHI= 10.0 DEG
R= 4.00	.73	.75	.85	.74	.55	.78	.56	UB/UINF	.94*	.97	.94*	1.00	.95	.98	.99	R= 4.12
UINF= 38.6 M/SEC	.06	.10	.03	.02	.07	.01	.02	VB/UINF	.01	.01	.00	.01	.02	-.00	.00	UINF= 39.1 M/SEC
X/D= 9.22	-.10	-.05	-.00	.06	.20	.11	.05	WB/UINF	-.05	-.06	-.10	-.06	-.06	-.06	-.08	X/D= 35.00
Z/D= 3.88	-.27	-.27	-.33	-.30	-.17	-.32	-.12	CP	-.07	-.11	-.09	-.11	-.05	-.06	-.06	Z/D= 8.50
PHI= 15.0 DEG	-.72	-.69	-.59	-.75	-.83	-.70	-.71	CPT	-.18	-.16	-.20	-.10	-.13	-.10	-.09	PHI= 6.3 DEG
R= 4.01	.81	.80	.82	.78	.76	.75	.78	UB/UINF	.95	.93	.94	.97	1.02	[illegible]	1.03	R= 4.13
UINF= 39.0 M/SEC	.06	.03	.09	.03	-.00	.08	.03	VB/UINF	.01	.00	.00	.01	.01	-.01	.00	UINF= 39.2 M/SEC
X/D= 9.22	-.11	-.05	.02	.09	.11	.11	.02	WB/UINF	-.07	-.06	-.06	-.06	-.09	-.01	-.08	X/D= 35.00
Z/D= 3.88	-.34	-.31	-.29	-.29	-.28	-.28	-.26	CP	-.12	-.11	-.09	-.11	-.13	.06	-.12	Z/D= 8.50
PHI= 15.0 DEG	-.67	-.66	-.61	-.66	-.69	-.70	-.65	CPT	-.20	-.24	-.21	-.16	-.09	-.07	-.04	PHI= 6.3 DEG
R= 4.13	.92	.82	.78	.85	.94	1.01	1.03*	UB/UINF	.96	.94	.98	.99	1.00	.93	1.03	R= 4.15
UINF= 39.6 M/SEC	.03	.01	.02	.02	.01	.02	.03	VB/UINF	.00	-.00	.02	-.00	.00	-.01	.02	UINF= 39.5 M/SEC
X/D= 14.00	-.01	.07	.04	.04	-.08	-.09	-.11	WB/UINF	-.06	-.07	-.06	-.09	-.04	-.08	-.10	X/D= 45.00
Z/D= 6.00	-.19	-.21	-.19	-.19	-.21	-.16	-.15	CP	-.10	-.06	-.09	-.08	-.06	-.03	-.10	Z/D= 9.75
PHI= 10.5 DEG	-.34	-.54	-.58	-.47	-.31	-.12	-.07	CPT	-.17	-.17	-.12	-.09	-.06	-.15	-.03	PHI= 5.8 DEG
R= 4.13	.76	.85	.83	.90	.93	.94	1.02	UB/UINF	.97	.95	.94	1.01	.98	.93	1.01	R= 4.16
UINF= 39.7 M/SEC	-.01	.03	.03	-.02	-.01	.01	.03	VB/UINF	-.00	-.02	-.02	.00	-.02	-.02	.00	UINF= 39.5 M/SEC
X/D= 14.00	.08	.08	.01	-.01	-.08	-.10	-.14	WB/UINF	-.06	-.08	-.06	-.07	-.02	-.01	-.08	X/D= 45.00
Z/D= 6.00	-.13	-.26	-.20	-.30	-.19	-.19	[illegible]	CP	-.08	-.04	-.01	-.07	-.02	.05	-.06	Z/D= 9.75
PHI= 10.5 DEG	-.54	-.54	-.51	-.49	-.32	-.30	[illegible]	CPT	-.12	-.13	-.13	-.03	-.06	-.09	-.02	PHI= 5.8 DEG
R= 4.13	.83	.81	.83	.90	.93	.89	1.06*	UB/UINF	.58	.61	.32$	.27$	.25	1.37	2.44*	R= 4.05
UINF= 38.7 M/SEC	.04	.03	-.01	-.00	.01	.01	.03	VB/UINF	-.01	.19	.05	.03	.05	.03	.06	UINF= 62.2 M/SEC
X/D= 18.00	-.08	-.04	-.05	-.08	-.11	-.09	-.10	WB/UINF	.18	.71	.91	.82	.44	.18	.55	X/D= 2.03
Z/D= 6.50	-.20	-.18	-.17	-.23	-.17	-.12	-.20	CP	-1.00	-1.05	-1.36	-1.58	-1.50	-2.08	-1.82	Z/D= 2.50
PHI= 10.2 DEG	-.50	-.51	-.48	-.42	-.28	-.30	-.06	CPT	-1.83	-1.14	-1.40	-1.83	-2.25	-1.13	3.83	PHI= 28.0 DEG
R= 4.12	.94	.88	.83	.84	.98*	.97	1.01*	UB/UINF	.79	.69	.35*	.32*	.24	1.30	2.45*	R= 4.06
UINF= 38.7 M/SEC	.01	.02	.01	.02	.01	.04	.01	VB/UINF	.06	.16	-.04	-.01	-.00	.02	.08	UINF= 62.1 M/SEC
X/D= 18.00	-.05	-.02	-.04	-.07	-.05	-.13	-.13	WB/UINF	.33	.65	.93	.70	.44	.25	.62	X/D= 2.03
Z/D= 6.50	-.24	-.21	-.20	-.16	-.22	-.22	-.17	CP	-.79	-1.13	-1.36	-1.89	-1.48	-1.97	-1.88	Z/D= 2.50
PHI= 10.2 DEG	-.35	-.44	-.51	-.45	-.26	-.25	-.12	CPT	-1.05	-1.14	-1.37	-2.29	-2.24	-1.19	3.91	PHI= 28.0 DEG

TABLE C2.- Continued

(b) R = 4. Continued.

TEST CONDITIONS	2R/D							
	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 4.06	.78	.79	.64	.61	.68	.71	1.04*	UB/UINF
UINF= 62.2 M/SEC	.01	.05	-.05	-.01	.01	-.01	.02	VB/UINF
X/D= 6.00	-.00	.22	.37	.35	.23	.07	-.07	WB/UINF
Z/D= 4.00	-.49	-.58	-.47	-.52	-.58	-.54	-.62	CP
PHI= 17.0 DEG	-.87	-.89	-.91	-1.02	-1.07	-1.02	-.51	CPT
R= 4.07	.69	.76	.64	.58	.63	.79	1.14*	UB/UINF
UINF= 62.4 M/SEC	.05	.03	.04	-.00	-.04	.01	.02	VB/UINF
X/D= 6.00	.09	.12	.31	.28	.20	.02	-.03	WB/UINF
Z/D= 4.00	-.48	-.59	-.56	-.59	-.65	-.56	-.67	CP
PHI= 17.0 DEG	-.99	-1.00	-1.05	-1.17	-1.21	-.93	-.34	CPT
R= 4.05	.82	.82	.87	.87	.90	.93	1.07	UB/UINF
UINF= 64.6 M/SEC	.03	.06	.02	.01	.03	-.03	.00	VB/UINF
X/D= 14.00	.01	.07	-.00	-.00	-.07	-.07	-.12	WB/UINF
Z/D= 6.00	-.16	-.15	-.20	-.18	-.17	-.15	-.16	CP
PHI= 10.5 DEG	-.48	-.47	-.45	-.42	-.34	-.28	.01	CPT
R= 4.05	.86	.86	.87	.83	.92	1.01	1.00	UB/UINF
UINF= 64.5 M/SEC	.05	-.01	.00	-.04	-.01	.02	.02	VB/UINF
X/D= 14.00	.03	.03	.05	-.03	-.04	-.11	-.13	WB/UINF
Z/D= 6.00	-.22	-.18	-.24	-.14	-.11	-.16	-.10	CP
PHI= 10.5 DEG	-.48	-.44	-.47	-.46	-.25	-.12	-.08	CPT

TABLE C2.- Continued

(b) R = 4. Concluded.

TEST CONDITIONS	2R/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 5.04	.68	.62	.62	.438	.33	1.03	2.76*	UB/UINF
UINF= 49.9 M/SEC	.07	.01	-.15	-.43	.05	.08	.08	VB/UINF
X/D= 2.00	.09	.69	1.05	1.12	.87	.29	.79	WB/UINF
Z/D= 2.99	-.99	-1.16	-1.95	-2.03	-1.72	-2.43	-3.13	CP
PHI= 32.6 DEG	-1.51	-1.29	-1.43	-1.38	-1.84	-2.27	4.55	CPT
R= 5.04	.79	.76	.57	.428	.42	1.12	2.94*	UB/UINF
UINF= 50.0 M/SEC	.18	-.05	-.27	-.17	-.03	-.01	.15	VB/UINF
X/D= 2.00	.25	.55	1.03	1.32	.91	.31	.76	WB/UINF
Z/D= 2.99	-.93	-1.51	-1.72	-1.56	-1.88	-2.31	-3.49	CP
PHI= 32.6 DEG	-1.20	-1.62	-1.24	-.60	-1.87	-1.95	5.25	CPT
R= 5.06	.22	.50	.56	.47	.51	.86	2.72*	UB/UINF
UINF= 49.2 M/SEC	.22	-.00	.04	-.08	-.09	.07	.12	VB/UINF
X/D= 2.05	.59	.74	1.17	1.25	.90	.34	.77	WB/UINF
Z/D= 3.00	-.49	-.87	-1.29	-2.17	-2.11	-2.33	-3.13	CP
PHI= 33.0 DEG	-1.14	-1.06	-.60	-1.37	-2.02	-2.48	4.27	CPT
R= 5.06	.59	.61	.60	.56	.348	.98	2.90*	UB/UINF
UINF= 49.2 M/SEC	.15	.10	.12	.09	-.33	.03	.10	VB/UINF
X/D= 2.05	.38	.75	1.09	1.08	.92	.38	.70	WB/UINF
Z/D= 3.00	-.74	-.91	-1.51	-2.67	-1.71	-2.39	-3.86	CP
PHI= 33.0 DEG	-1.24	-.95	-.94	-2.18	-1.63	-2.30	4.56	CPT
R= 5.05	.75	.73	.76	.74	.74	.80	1.00	UB/UINF
UINF= 49.6 M/SEC	-.01	.07	-.03	-.04	-.03	.01	.01	VB/UINF
X/D= 6.00	.18	.39	.45	.49	.45	.22	.06	WB/UINF
Z/D= 5.00	-.62	-.55	-.66	-.67	-.64	-.69	-.69	CP
PHI= 20.0 DEG	-1.02	-.85	-.87	-.87	-.89	-.99	-.68	CPT
R= 5.06	.71	.69	.85	.74	.65	.80	.92	UB/UINF
UINF= 49.3 M/SEC	-.01	-.02	-.04	-.09	-.03	-.01	-.00	VB/UINF
X/D= 6.00	.26	.43	.44	.48	.48	.25	.03	WB/UINF
Z/D= 5.00	-.57	-.67	-.73	-.68	-.57	-.66	-.64	CP
PHI= 20.0 DEG	-.99	-.81	-.80	-.88	-.91	-.96	-.78	CPT
R= 5.05	.90	.68*	.85	.89	.81	.86	.92	UB/UINF
UINF= 50.9 M/SEC	.07	.10	.03	-.03	-.01	.01	.01	VB/UINF
X/D= 9.68	.17	.36	.25	.29	.28	.22	.05	WB/UINF
Z/D= 5.98	-.42	-.23	-.44	-.49	-.44	-.43	-.40	CP
PHI= 15.0 DEG	-.59	-.63	-.65	-.62	-.70	-.53	-.54	CPT
R= 5.05	.88	.87	.86	.71	.84*	.80	.89	UB/UINF
UINF= 51.0 M/SEC	.07	.05	.02	-.01	-.02	-.03	-.02	VB/UINF
X/D= 9.68	.15	.27	.32	.33	.34	.17	.03	WB/UINF
Z/D= 5.98	-.41	-.36	-.42	-.30	-.37	-.39	-.38	CP
PHI= 15.0 DEG	-.60	-.53	-.56	-.48	-.54	-.72	-.59	CPT

2R/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
.80	.84	.86	.85	.85	.92	1.02	R= 5.05
.03	-.01	.00	-.01	-.01	-.02	-.02	UINF= 51.1 M/SEC
.11	.19	.17	.18	.15	.03	-.03	X/D= 14.00
-.22	-.27	-.32	-.31	-.33	-.26	-.33	Z/D= 7.00
-.56	-.52	-.55	-.55	-.57	-.60	-.28	PHI= 13.0 DEG
.86	.86*	.79	.90*	.89	.87	1.00	R= 5.05
.01	.03	.02	-.01	-.01	-.01	-.01	UINF= 51.2 M/SEC
.13	.13	.22	.12	.11	.11	-.01	X/D= 14.00
-.33	-.33	-.28	-.34	-.32	-.28	-.32	Z/D= 7.00
-.57	-.57	-.53	-.51	-.51	-.50	-.32	PHI= 13.0 DEG

TABLE C2.- Continued.

(c) R = 5.

TEST CONDITIONS	2R/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		2R/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 6.09	.49	.86	.57	.84	.51*	.86	2.92*	UR/UINF	.63	.71	.75	.74	.70	.70	1.21	R= 6.03
UINF= 25.7 M/SEC	.10	.24	.17	.15	-.03	-.07	.04	VR/UINF	.00	-.05	.01	-.12	-.27	-.03	.10	UINF= 41.2 M/SEC
X/D= 2.00	.25	.66	1.25	1.23	1.30	.64	.89	WR/UINF	.44	.65	.63	1.03	.01	.65	.30	X/D= 4.00
Z/D= 3.50	-.56	-.93	-1.12	-3.50	-2.05	-2.54	-4.62	CP	-.64	-.64	-1.19	-.91	-1.49	-1.21	-1.30	Z/D= 5.00
PHI= 30.0 DEG	-1.24	-.67	-.20	-2.56	-1.11	-2.34	3.84	CPT	-.85	-.71	-.92	-.20	-1.13	-1.17	-.80	PHI= 20.0 DEG
R= 6.10	.44	.72	.71	.56	.67	1.02	3.06*	UR/UINF	.75	.60	.74	.83	.65	.70	1.10	R= 6.02
UINF= 25.7 M/SEC	.34	-.18	.03	.07	-.08	.03	-.00	VR/UINF	.05	-.04	-.15	-.06	-.02	-.00	.14	UINF= 41.3 M/SEC
X/D= 2.00	.23	.67	1.10	1.25	1.13	.50	.04	WR/UINF	.39	.76	.06	.08	.91	.63	.34	X/D= 4.00
Z/D= 3.50	-.61	-1.09	-1.40	-3.05	-2.74	-2.72	-5.17	CP	-.61	-.31	-1.07	-1.49	-1.13	-1.23	-1.41	Z/D= 5.00
PHI= 30.0 DEG	-1.05	-1.32	-.73	-2.15	-2.01	-2.42	4.04	CPT	-.83	-.37	-.75	-.92	-.88	-1.23	-.84	PHI= 20.0 DEG
R= 6.12	.75	.82	.71	.80	.90	.83	.96	UR/UINF	.91	.80	.77	.91	.80	.83	.90	R= 6.03
UINF= 25.7 M/SEC	-.34	.00	.10	-.10	-.04	.07	.07	VR/UINF	.05	.05	-.06	-.03	-.10	.00	.01	UINF= 41.2 M/SEC
X/D= 6.00	.44	.59	.76	.74	.62	.60	.42	WR/UINF	.34	.51	.61	.77	.84	.63	.30	X/D= 6.00
Z/D= 6.00	-.27	-.43	-.41	-.71	-.97	-.86	-.84	CP	-.50	-.61	-.82	-.82	-.83	-.77	-.68	Z/D= 6.00
PHI= 24.0 DEG	-.51	-.41	-.33	-.44	-.60	-.44	-.53	CPT	-.56	-.55	-.84	-.47	-.43	-.84	-.72	PHI= 24.0 DEG
R= 6.14	.92	.85	.74	.79	.75	1.15	.84	UR/UINF	.82	.94	.82	.80	.79	.90	.73	R= 6.05
UINF= 25.8 M/SEC	.07	.12	-.11	-.02	.02	.04	-.14	VR/UINF	-.01	-.03	-.03	-.07	.05	.07	.00	UINF= 41.2 M/SEC
X/D= 6.00	.40	.56	.77	.86	.60	.44	.38	WR/UINF	.37	.50	.72	.75	.60	.56	.35	X/D= 6.00
Z/D= 6.00	-.48	-.38	-.48	-.58	-.57	-1.03	-.50	CP	-.84	-.72	-.59	-.89	-.73	-.85	-.36	Z/D= 6.00
PHI= 24.0 DEG	-.48	-.33	-.33	-.22	-.38	-.50	-.43	CPT	-.85	-.59	-.38	-.50	-.60	-.57	-.70	PHI= 24.0 DEG
R= 6.05	.96	.87	.93	.95	.98	.96	1.07	UR/UINF	.80	.85	.95	.91	.91	.95	.96	R= 6.04
UINF= 26.5 M/SEC	.07	.03	.03	-.01	.02	.03	-.02	VR/UINF	.09	-.04	-.03	.05	-.06	.02	-.05	UINF= 42.0 M/SEC
X/D= 14.00	.26	.29	.45	.40	.41	.36	.22	WR/UINF	.45	.53	.53	.51	.41	.37	.19	X/D= 8.00
Z/D= 8.50	-.34	-.20	-.25	-.36	-.33	-.31	-.35	CP	-.48	-.54	-.76	-.71	-.61	-.63	-.50	Z/D= 7.00
PHI= 14.0 DEG	-.34	-.36	-.10	-.28	-.21	-.26	-.15	CPT	-.62	-.54	-.56	-.60	-.41	-.63	-.50	PHI= 20.0 DEG
R= 6.07	1.06	.75	1.03	.98	.89	.92	.96	UR/UINF	.81	.81	[illegible]	.89	.84*	.85	1.10	R= 6.04
UINF= 26.5 M/SEC	.07	-.01	-.00	-.03	.01	-.02	-.02	VR/UINF	.04	-.03	-.01	-.05	-.03	-.02	-.05	UINF= 42.1 M/SEC
X/D= 14.00	.22	.42	.32	.40	.36	.32	.22	WR/UINF	.44	.55	.53	.52	.51	.28	.22	X/D= 8.00
Z/D= 8.50	-.37	-.06	-.48	-.34	-.26	-.29	-.27	CP	-.43	-.48	-.61	-.67	-.52	-.56	-.61	Z/D= 7.00
PHI= 15.0 DEG	-.19	-.30	-.31	-.24	-.36	-.33	-.32	CPT	-.57	-.52	-.59	-.60	-.54	-.75	-.36	PHI= 20.0 DEG
R= 6.04	.70	.81	.82	.55	.50	.86	3.17*	UR/UINF	.91	.93	.95	.92	.86	.85	1.08	R= 6.04
UINF= 41.1 M/SEC	.23	.28	.21	.04	-.07	-.06	.05	VR/UINF	-.02	.00	.01	.00	-.04	-.02	-.03	UINF= 42.4 M/SEC
X/D= 2.00	.19	.68	1.11	1.30	1.19	.62	.85	WR/UINF	.45	.47	.44	.49	.29	.10	.02	X/D= 9.60
Z/D= 3.50	-.49	-.71	-1.94	-3.12	-2.14	-2.54	-4.07	CP	-.44	-.51	-.54	-.49	-.43	-.34	-.41	Z/D= 8.00
PHI= 30.0 DEG	-.92	-.80	-1.28	-2.10	-1.45	-2.40	5.39	CPT	-.41	-.41	-.42	-.40	-.42	-.59	-.23	PHI= 10.0 DEG
R= 6.01	.68	.74	.62	.55	.51	1.23	3.11*	UR/UINF	.86	.97	.93	.91	.99	.89	1.05	R= 6.04
UINF= 41.1 M/SEC	-.09	.07	-.20	-.06	-.16	.01	.09	VR/UINF	-.02	.05	.06	-.03	.02	-.01	-.02	UINF= 42.4 M/SEC
X/D= 2.00	.19	.71	1.17	1.39	1.21	.49	.98	WR/UINF	.50	.45	.48	.43	.26	.10	.05	X/D= 9.60
Z/D= 3.50	-.81	-1.02	-1.87	-2.87	-2.17	-2.86	-4.28	CP	-.38	-.50	-.51	-.55	-.52	-.35	-.40	Z/D= 8.00
PHI= 30.0 DEG	-1.30	-.97	-1.08	-1.60	-1.41	-2.11	5.84	CPT	-.34	-.44	-.41	-.53	-.47	-.53	-.30	PHI= 10.0 DEG

TABLE C2.- Continued

(d) R = 6.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 6.06	.94	.96	.97	.89	.95	.97	1.06	UB/UINF	.98	.98	1.00	.95	.99	1.02	1.01	R= 6.06
UINF= 42.4 M/SEC	.06	.08	-.06	.01	-.06	-.01	-.01	VB/UINF	.01	-.02	-.01	-.03	-.01	-.06	-.01	UINF= 41.9 M/SEC
X/D= 12.00	.35	.34	.38	.36	.28	.15	.05	WB/UINF	.07	.04	.08	.05	.01	.02	-.02	X/D= 35.00
Z/D= 8.50	-.43	-.41	-.47	-.38	-.42	-.48	-.4[illegible]	CP	-.13	-.17	-.20	-.15	-.18	-.16	-.13	Z/D= 13.00
PHI= 17.0 DEG	-.41	-.36	-.37	-.46	-.43	-.44	-.27	CPT	-.17	-.20	-.18	-.26	-.19	-.10	-.11	PHI= 9.3 DEG
R= 6.06	.99	.93	.97	.95	.98	.95	1.03	UB/UINF	1.00	1.01	.97	1.01	1.02	.98	1.01	R= 6.08
UINF= 42.4 M/SEC	.01	.03	-.02	-.02	-.01	-.03	-.03	VB/UINF	.01	-.01	.01	-.01	-.01	-.01	-.02	UINF= 41.6 M/SEC
X/D= 12.00	.31	.42	[illegible]	.37	.28	.12	.09	WB/UINF	.06	.08	.02	.07	.01	.01	-.07	X/D= 35.00
Z/D= 8.50	-.44	-.37	[illegible]	-.46	-.42	-.36	-.44	CP	-.22	-.23	-.15	-.21	-.21	-.15	-.20	Z/D= 13.00
PHI= 17.0 DEG	-.36	-.33	-.3[illegible]	-.42	-.38	-.44	-.36	CPT	-.21	-.20	-.22	-.19	-.16	-.19	-.17	PHI= 9.3 DEG
R= 6.03	.90	.93	.93	.98	1.05	.91	1.03	UB/UINF	1.01	1.03	.96	1.02	.99	.95	.97	R= 6.02
UINF= 42.6 M/SEC	.04	.08	.02	-.00	-.01	-.03	-.00	VB/UINF	.02	-.00	.01	-.01	-.02	-.01	.02	UINF= 40.3 M/SEC
X/D= 16.00	.29	.29	.30	[illegible]	.29	.28	.15	WB/UINF	.07	.01	.03	.03	-.03	-.02	-.06	X/D= 35.00
Z/D= 8.50	-.30	-.36	-.37	[illegible]	-.48	-.29	-.36	CP	-.16	-.16	-.10	-.12	-.11	-.07	-.06	Z/D= 13.00
PHI= 15.0 DEG	-.40	-.40	-.41	-.37	-.28	-.30	-.27	CPT	-.11	-.08	-.18	-.09	-.13	-.16	-.11	PHI= 9.5 DEG
R= 6.06	.99	.99	.95	1.00	.87	.97	1.02	UB/UINF	1.00	.96	.97	.96	1.03	1.06	.98	R= 5.98
UINF= 42.4 M/SEC	.03	-.02	.02	-.03	-.06	-.02	-.06	VB/UINF	-.02	-.05	-.00	-.03	-.01	.00	-.02	UINF= 41.6 M/SEC
X/D= 16.00	.27	.30	.26	.36	.29	.25	.12	WB/UINF	.06	.05	.06	.01	-.06	-.05	-.10	X/D= 35.00
Z/D= 8.50	-.35	-.39	-.40	-.36	-.29	-.37	-.41	CP	-.09	-.07	-.07	-.06	-.08	-.06	-.02	Z/D= 13.00
PHI= 15.0 DEG	-.29	-.32	-.42	-.23	-.44	-.36	-.35	CPT	-.09	-.16	-.13	-.08	-.02	.06	-.06	PHI= 9.5 DEG
R= 6.06	.98	.96*	1.02*	.95	.93	.92	1.03	UB/UINF	.96*	.96	.97	.99	.98	.97	1.00	R= 6.06
UINF= 41.9 M/SEC	.01	.02	-.01	.00	-.01	-.00	-.01	VB/UINF	-.02	-.01	-.02	-.03	-.06	-.01	-.01	UINF= 42.3 M/SEC
X/D= 18.00	.22	.18	.28	.20	.16	.07	.03	WB/UINF	.05	.02	.03	.03	.01	.02	-.06	X/D= 45.00
Z/D= 10.00	-.23	-.25	-.28	-.26	-.20	-.17	-.23	CP	-.09	-.16	-.11	-.13	-.12	-.07	-.10	Z/D= 14.75
PHI= 16.0 DEG	-.20	-.33	-.18	-.29	-.32	-.32	-.16	CPT	-.20	-.23	-.16	-.15	-.20	-.12	-.09	PHI= 8.1 DEG
R= 6.05	.95	1.00	.98	.99	.98	.97	1.03	UB/UINF	.96	1.00	.98	.98*	1.01	.95	1.00	R= 6.03
UINF= 41.9 M/SEC	.06	.01	-.06	.01	-.06	-.03	.02	VB/UINF	-.02	.00	-.02	-.03	-.01	-.02	-.02	UINF= 42.2 M/SEC
X/D= 18.00	.26	.25	.19	.16	.16	.06	-.00	WB/UINF	.01	.02	.06	-.02	-.00	-.01	-.07	X/D= 45.00
Z/D= 10.00	-.20	-.29	-.27	-.26	-.20	-.20	-.19	CP	-.15	-.20	-.12	-.12	-.15	-.06	-.12	Z/D= 14.75
PHI= 16.0 DEG	-.23	-.22	-.27	-.23	-.27	-.24	-.12	CPT	-.25	-.21	-.20	-.15	-.13	-.16	-.11	PHI= 8.1 DEG
R= 6.02	.97	.95	.96	.96	1.05	1.01*	.97	UB/UINF	.67	.67	.59	.38*	.38*	[illegible]	3.26*	R= 6.11
UINF= 41.6 M/SEC	.06	.01	-.06	-.06	-.01	-.02	-.03	VB/UINF	.03	-.03	-.07	.01	-.07	-.05	.16	UINF= 50.9 M/SEC
X/D= 25.02	.16	.19	.18	.15	.10	.02	-.02	WB/UINF	.32	.71	1.12	1.08	1.26	.63	.63	X/D= 2.00
Z/D= 11.00	-.21	-.19	-.13	-.19	-.25	-.19	-.15	CP	-.31	-.76	-1.96	-2.77	-2.11	-2.89	-6.96	Z/D= 3.50
PHI= 10.0 DEG	-.26	-.25	-.19	-.27	-.13	-.18	-.21	CPT	-.98	-.79	-1.33	-2.65	-1.68	-2.69	5.73	PHI= 38.0 DEG
R= 6.02	.87*	.96	.99*	.92	.91	.90	1.01*	UB/UINF	.50	.60	.53	.39*	.38*	.83	1.01*	R= 6.09
UINF= 41.6 M/SEC	-.06	.03	.02	-.02	-.05	-.06	.02	VB/UINF	-.13	.09	-.01	.01	-.07	-.02	.06	UINF= 50.9 M/SEC
X/D= 25.02	.20	.16	.11	.15	.10	.07	.06	WB/UINF	.32	.70	1.14	1.09	1.23	.60	.96	X/D= 2.00
Z/D= 11.00	-.09	-.23	-.20	-.17	-.16	-.13	-.22	CP	-.32	-.67	-1.51	-2.69	-2.13	-2.71	-3.60	Z/D= 3.50
PHI= 10.0 DEG	-.28	-.27	-.20	-.31	-.30	-.32	-.20	CPT	-.95	-.81	-.80	-2.33	-1.65	-2.56	5.72	PHI= 38.0 DEG

TABLE C2.- Continued

(d) R = 6. Continued.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 6.09	.92	.89	.90	.89*	.88	.91	.85	UB/UINF
UINF= 50.8 M/SEC	.05	.05	.00	-.02	-.07	.01	-.03	VB/UINF
X/D= 6.00	.29	.50	.67	.69	.74	.60	.45	WB/UINF
Z/D= 6.00	-.43	-.58	-.71	-.93	-.70	-.79	-.62	CP
PHI= 24.0 DEG	-.49	-.53	-.44	-.66	-.35	-.59	-.69	CPT
R= 6.12	.80	.89	.84	.83	.97	.82	.93	UB/UINF
UINF= 50.6 M/SEC	.07	.02	.03	.04	-.03	.04	-.03	VB/UINF
X/D= 6.00	.35	.47	.68	.75	.73	.60	.43	WB/UINF
Z/D= 6.00	-.33	-.45	-.67	-.72	-.87	-.73	-.70	CP
PHI= 24.0 DEG	-.55	-.43	-.49	-.45	-.37	-.69	-.66	CPT
R= 6.07	.97	.92*	.92	.91	.96	1.02*	.99	UB/UINF
UINF= 52.7 M/SEC	.05	.04	.03	.03	-.02	-.02	-.07	VB/UINF
X/D= 14.00	.31	.33	.41	.40	.30	.37	.19	WB/UINF
Z/D= 8.50	-.29	-.27	-.32	-.33	-.44	-.36	-.36	CP
PHI= 15.0 DEG	-.23	-.31	-.30	-.34	-.42	-.16	-.34	CPT
R= 6.07	.90	.97	.93	1.02	.94	1.01	.94	UB/UINF
UINF= 52.5 M/SEC	.07	.06	.06	.05	.01	-.01	-.04	VB/UINF
X/D= 14.00	.32	.35	.41	.39	.38	.32	.26	WB/UINF
Z/D= 8.50	-.23	-.29	-.38	-.40	-.38	-.38	-.29	CP
PHI= 15.0 DEG	-.31	-.21	-.33	-.20	-.35	-.24	-.33	CPT

TABLE C2.- Continued

(d) R = 6. Concluded.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 7.02	.60	.66	.63	.49$	.53*	1.07	3.32*	UB/UINF
UINF= 44.1 M/SEC	.02	-.09	-.15	.00	-.08	.02	.08	VB/UINF
X/D= 2.00	.10	.70	1.09	1.37	1.42	.82	.87	WB/UINF
Z/D= 4.00	-.34	-.72	-2.14	-3.46	-3.04	-3.20	-5.40	CP
PHI= 41.6 DEG	-.97	-.79	-1.53	-2.32	-1.72	-2.37	6.05	CPT
R= 7.03	.44	.47	.57	.48$	.43$	.91	3.01*	UB/UINF
UINF= 44.1 M/SEC	.06	.08	-.01	.00	-.10	.06	.08	VB/UINF
X/D= 2.00	.32	.77	1.12	1.36	1.59	.93	.90	WB/UINF
Z/D= 4.00	-.19	-.41	-1.99	-3.52	-2.17	-2.99	-4.97	CP
PHI= 41.6 DEG	-.89	-.59	-1.41	-2.41	-.43	-2.29	4.37	CPT
R= 7.03	.70	.25$	.46$	.48$	.60*	1.13	3.43*	UB/UINF
UINF= 43.9 M/SEC	.00	.03	.10	.00	-.08	.14	.08	VB/UINF
X/D= 2.00	.26	.96	1.34	1.35	1.37	.76	.84	WB/UINF
Z/D= 4.00	-.36	.13	-1.14	-3.54	-3.09	-3.36	-5.45	CP
PHI= 42.0 DEG	-.80	.11	-.10	-2.47	-1.84	-2.47	6.75	CPT
R= 7.03	.68	.57	.54	.48$	.50$	1.06	3.31*	UB/UINF
UINF= 43.9 M/SEC	.00	.10	-.10	.00	-.08	.03	.08	VB/UINF
X/D= 2.00	.17	.79	1.11	1.34	1.41	.81	.94	WB/UINF
Z/D= 4.00	-.31	-.52	-2.01	-3.56	-3.06	-3.20	-5.01	CP
PHI= 42.0 DEG	-.81	-.55	-1.46	-2.51	-1.79	-2.41	6.48	CPT
R= 7.02	.94	.84	.85	.85	.86	.91	1.05	UB/UINF
UINF= 43.8 M/SEC	.07	.13	.05	-.02	-.01	-.14	-.02	VB/UINF
X/D= 6.00	.40	.61	.83	.94	.98	.88	.47	WB/UINF
Z/D= 7.00	-.33	-.51	-.75	-.83	-.78	-.78	-.97	CP
PHI= 27.0 DEG	-.27	-.41	-.33	-.21	-.07	-.15	-.65	CPT
R= 7.04	.86	1.12	.89	.95*	.98*	.95	1.16	UB/UINF
UINF= 43.8 M/SEC	.12	.08	.04	-.04	.12	-.01	-.03	VB/UINF
X/D= 6.00	.38	.50	.82	.86	.84	.84	.52	WB/UINF
Z/D= 7.00	-.34	-.89	-.86	-1.15	-1.16	-.85	-1.07	CP
PHI= 27.0 DEG	-.43	-.36	-.39	-.49	-.47	-.23	-.45	CPT
R= 7.04	.92	.98	.96	1.12	1.00	.93	1.15	UB/UINF
UINF= 45.1 M/SEC	.03	.04	.10	.03	.04	.06	-.02	VB/UINF
X/D= 9.88	.50	.58	.69	.66	.62	.53	.33	WB/UINF
Z/D= 8.98	-.35	-.59	-.59	-.87	-.67	-.56	-.76	CP
PHI= 20.0 DEG	-.25	-.27	-.17	-.18	-.28	-.41	-.32	CPT
R= 7.02	.97	.96	.90	.97	.98	.95	1.02	UB/UINF
UINF= 45.3 M/SEC	.10	.08	.07	.04	.02	.03	-.04	VB/UINF
X/D= 9.88	.48	.60	.73	.65	.61	.53	.42	WB/UINF
Z/D= 8.98	-.48	-.55	-.52	-.75	-.62	-.61	-.54	CP
PHI= 20.0 DEG	-.29	-.26	-.16	-.38	-.27	-.43	-.31	CPT

ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
.96	.99	.93	.98	.92	.96	1.01	R= 7.02
.03	.07	.04	.01	-.04	-.07	-.09	UINF= 45.2 M/SEC
.48	.53	.54	.53	.45	.38	.27	X/D= 14.00
-.34	-.37	-.41	-.48	-.46	-.33	-.38	Z/D= 10.45
-.17	-.10	-.26	-.22	-.40	-.26	-.26	PHI= 17.5 DEG
.98	1.00*	.98	.93	.94	1.00	1.05	R= 7.01
.07	.04	.05	-.03	-.05	-.00	-.01	UINF= 45.3 M/SEC
.48	.49	.54	.53	.48	.37	.26	X/D= 14.00
-.33	-.41	-.50	-.39	-.32	-.43	-.43	Z/D= 10.45
-.14	-.17	-.24	-.23	-.19	-.29	-.25	PHI= 17.5 DEG

TABLE C2.- Continued

(e) R = 7.

TEST CONDITIONS	ZB/D								ZB/D							TEST CONDITIONS
	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 8.16	.95	.38$	.62	.79	.58	2.00	3.69*	UB/UINF	.83	.84	.89	1.53	2.73*	2.71*	1.54*	R= 8.02
UINF= 19.2 M/SEC	.01	.19	-.32	-.15	-.12	.17	.15	VB/UINF	-.02	-.23	.13	.19	.12	.13	.08	UINF= 30.8 M/SEC
X/D= 2.00	.49	1.16	1.41	1.58	1.36	.75	1.31	WB/UINF	1.29	1.39	1.09	.51	.67	.78	.44	X/D= 2.00
Z/D= 5.00	-.53	.04	-1.42	-2.68	-1.51	-4.23	-5.66	CP	-1.94	-1.75	-1.76	-2.28	-2.94	-2.69	-1.02	Z/D= 6.75
PHI= 45.0 DEG	-.39	.57	.06	-.54	-.29	-.62	8.92	CPT	-.58	-.05	-.76	-.63	4.12	4.42	.56	PHI= 44.7 DEG
R= 8.15	.75	.40$	.77	.83	.98	2.17	3.86*	UB/UINF	.86	.92	.92	1.60	2.65*	2.70*	1.25*	R= 8.01
UINF= 19.3 M/SEC	-.17	-.32	-.23	-.21	-.02	.25	.11	VB/UINF	-.09	-.08	.03	.10	.16	.12	.11	UINF= 30.9 M/SEC
X/D= 2.00	.28	1.06	1.27	1.32	1.13	.80	1.42	WB/UINF	1.33	1.41	1.11	.58	.66	.80	.39	X/D= 2.00
Z/D= 5.00	-.46	-.10	-2.07	-3.47	-2.71	-4.08	-5.89	CP	-1.84	-1.92	-1.85	-2.33	-3.08	-2.11	-.78	Z/D= 6.75
PHI= 45.0 DEG	-.79	.29	-.80	-2.00	-1.46	.35	10.28	CPT	-.30	-.07	-.75	-.40	3.52	4.95	-.05	PHI= 44.7 DEG
R= 8.25	.68	1.11	1.10	.94	1.05	.98	1.10	UB/UINF	.86	1.00	.94	.84	1.23	1.10	1.15	R= 8.08
UINF= 19.3 M/SEC	-.04	-.10	-.15	-.00	-.13	.05	.02	VB/UINF	-.05	-.12	-.08	-.05	.00	.14	.10	UINF= 30.9 M/SEC
X/D= 6.00	.68	.70	.79	.93	.94	.76	.55	WB/UINF	.64	.74	.97	1.05	.81	.74	.49	X/D= 6.00
Z/D= 8.00	.90	.02	-.21	.04	-.16	.05	-.03	CP	-.06	-.48	-.65	-.80	-1.13	-.75	-.73	Z/D= 8.00
PHI= 30.0 DEG	.82	.76	.64	.79	.86	.59	.50	CPT	.09	.09	.17	.02	.05	.03	-.15	PHI= 30.0 DEG
R= 8.26	.82	.88	.96	1.20*	.93	1.05	1.18	UB/UINF	.82	.90	.88	1.02	.68*	.94	.73	R= 8.03
UINF= 19.3 M/SEC	.09	-.32	-.25	-.08	-.06	-.01	.07	VB/UINF	.09	-.14	-.17	-.16	-.07	.04	.07	UINF= 30.9 M/SEC
X/D= 6.00	.51	.83	.91	.78	.99	.80	.51	WB/UINF	.69	.79	1.00	.96	1.15	.88	.59	X/D= 6.00
Z/D= 8.00	.69	.89	.02	-.76	.09	-.25	-.04	CP	.26	-.31	-.45	-1.12	-.19	-.44	-.18	Z/D= 8.00
PHI= 30.0 DEG	.63	1.46	.82	.29	.95	.49	.62	CPT	.41	.15	.35	-.13	.61	.22	-.29	PHI= 30.0 DEG
R= 8.03	.91	.97	1.01	1.21	.89	.97	1.08	UB/UINF	1.00	1.04	1.02	1.01	1.06	1.13	.99	R= 8.03
UINF= 19.8 M/SEC	.09	.05	.05	-.05	-.03	.09	-.05	VB/UINF	.04	.04	.13	.07	.07	-.03	.00	UINF= 31.6 M/SEC
X/D= 15.18	.50	.60	.53	.58	.46	.31	.32	WB/UINF	.49	.47	.56	.62	.50	.54	.28	X/D= 15.18
Z/D= 11.98	-.93	-.85	-1.02	-1.26	-.89	-1.04	-1.08	CP	-.57	-.74	-.76	-.67	-.73	-.76	-.57	Z/D= 11.98
PHI= 20.0 DEG	-.83	-.54	-.72	-.47	-.89	-1.00	-.81	CPT	-.33	-.43	-.38	-.26	-.35	-.19	-.50	PHI= 20.0 DEG
R= 7.99	.92	.92	1.01	.86	1.14	.86	.88	UB/UINF	1.02	.99	.98	1.13	.96	.91	.84	R= 8.02
UINF= 19.8 M/SEC	.03	-.07	.10	.07	-.06	-.00	.10	VB/UINF	.02	-.06	.05	.03	-.02	.03	.09	UINF= 31.6 M/SEC
X/D= 15.18	.51	.58	.52	.54	.46	.34	.30	WB/UINF	.47	.51	.63	.55	.58	.37	.41	X/D= 15.18
Z/D= 11.98	-.81	-.84	-1.13	-.93	-1.20	-.91	-.72	CP	-.55	-.65	-.63	-.92	-.70	-.62	-.43	Z/D= 11.98
PHI= 20.0 DEG	-.70	-.66	-.83	-.89	-.69	-1.05	-.84	CPT	-.29	-.41	-.27	-.34	-.44	-.65	-.56	PHI= 20.0 DEG
R= 8.03	.58	.82	.71	.79	.97	2.35	3.82*	UB/UINF	.80	.70	.68	.59$	.67	2.27	3.70*	R= 8.06
UINF= 30.9 M/SEC	-.28	.04	-.05	-.49	.04	.21	.12	VB/UINF	-.06	-.02	-.12	-.04	.04	.10	.09	UINF= 38.4 M/SEC
X/D= 2.00	.51	.95	1.47	1.54	1.01	.70	1.37	WB/UINF	.40	.96	1.36	1.64	1.29	.69	1.20	X/D= 2.00
Z/D= 5.00	-.36	-1.09	-2.12	-3.08	-3.14	-4.46	-5.61	CP	-.28	-1.06	-3.07	-3.09	-2.29	-4.74	-5.00	Z/D= 5.00
PHI= 45.0 DEG	-.68	-.50	-.46	-.82	-2.17	.70	10.46	CPT	-.48	-.65	-1.73	-1.03	-1.16	.01	9.98	PHI= 45.0 DEG
R= 8.03	.69	.58	.78	.77	.86	2.27	3.84*	UB/UINF	.65	.69	.67	.58$	.70	2.00	3.76*	R= 8.06
UINF= 31.0 M/SEC	-.16	-.13	-.44	-.22	-.00	.21	.19	VB/UINF	.13	.09	-.15	-.32	-.23	.02	.06	UINF= 38.6 M/SEC
X/D= 2.00	.60	1.09	1.38	1.59	1.15	.68	1.40	WB/UINF	.50	1.01	1.39	1.67	1.22	.69	1.19	X/D= 2.00
Z/D= 5.00	-.47	-.75	-2.63	-2.96	-2.72	-4.15	-5.75	CP	-.04	-1.06	-2.90	-2.76	-2.67	-4.26	-5.27	Z/D= 5.00
PHI= 45.0 DEG	-.60	-.21	-.91	-.77	-1.65	.59	10.61	CPT	-.36	-.55	-1.48	-.51	-1.64	-.72	10.18	PHI= 45.0 DEG

TABLE C2.- Continued

(f) R = 8.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 8.02	.95	.97	.86	.91	1.18	1.02	1.52	UB/UINF	.98	.81	1.02	1.01	.91	1.17	1.17	R= 8.04
UINF= 38.1 M/SEC	-.00	-.08	.07	-.00	-.03	-.05	.01	VB/UINF	.09	.06	.12	.02	.01	.08	-.04	UINF= 38.5 M/SEC
X/D= 4.00	.56	.75	1.10	1.24	1.00	.84	.41	WB/UINF	.12	.29	.46	.61	.76	.72	.65	X/D= 8.81
Z/D= 6.98	-.63	-1.43	-1.71	-1.87	-2.24	-1.56	-1.88	CP	-.07	.07	-.27	-.45	-.34	-1.02	-1.01	Z/D= 8.31
PHI= 35.0 DEG	-.42	-.91	-.73	-.49	-.83	-.81	-.40	CPT	-.09	-.18	.00	-.06	.08	-.13	-.20	PHI= 30.0 DEG
R= 8.04	.83	.80	.83	.76	.91	.84	1.35	UB/UINF	.92	.99	.99	1.00	.99	1.09	.90	R= 8.03
UINF= 38.0 M/SEC	-.07	.06	-.00	-.09	-.04	.02	-.04	VB/UINF	.06	.05	.02	.11	-.07	.02	-.01	UINF= 38.6 M/SEC
X/D= 4.00	.63	.86	1.19	1.33	1.27	1.02	.52	WB/UINF	.09	.32	.40	.61	.71	.74	.78	X/D= 8.81
Z/D= 6.98	-.43	-.99	-1.56	-1.19	-1.54	-1.04	-1.68	CP	.08	-.05	-.20	-.40	-.61	-.79	-.36	Z/D= 8.31
PHI= 35.0 DEG	-.34	-.60	-.44	.20	-.08	-.27	-.57	CPT	-.05	.03	-.05	-.02	-.10	-.04	.05	PHI= 30.0 DEG
R= 8.05	.83	.90	1.09	1.08	1.09	1.17	1.14	UB/UINF	.98	1.01	1.00	.91	.95	1.05	1.03	R= 8.01
UINF= 38.7 M/SEC	.09	-.02	-.07	.07	-.05	.09	-.09	VB/UINF	.14	.17	.13	.09	-.04	.03	.01	UINF= 39.2 M/SEC
X/D= 5.63	.02	.35	.56	.83	.84	.83	.70	WB/UINF	.53	.70	.75	.81	.85	.73	.52	X/D= 9.80
Z/D= 7.13	-.15	-.41	-.90	-1.15	-1.45	-1.61	-1.21	CP	-.39	-.44	-.85	-.80	-.73	-.84	-.65	Z/D= 10.00
PHI= 41.9 DEG	-.45	-.48	-.38	-.27	-.53	-.52	-.42	CPT	-.12	.10	-.27	-.30	-.09	-.18	-.31	PHI= 23.0 DEG
R= 8.01	.97	.97	1.16	1.06	1.18	1.27	1.12	UB/UINF	.95	.94	.86	.93	.95	.94	1.23	R= 8.05
UINF= 38.8 M/SEC	.06	.13	.04	.15	.07	.00	-.05	VB/UINF	.06	.04	-.01	.04	.02	-.02	.01	UINF= 39.3 M/SEC
X/D= 5.63	.13	.38	.58	.78	.83	.82	.68	WB/UINF	.52	.66	.79	.84	.83	.85	.53	X/D= 9.80
Z/D= 7.13	-.24	-.29	-.88	-1.06	-1.41	-1.66	-1.21	CP	-.36	-.52	-.58	-.81	-.70	-.63	-1.00	Z/D= 10.00
PHI= 41.9 DEG	-.29	-.18	-.18	-.28	-.31	-.35	-.48	CPT	-.18	-.18	-.21	-.22	-.10	-.03	-.19	PHI= 23.0 DEG
R= 8.05	.87	.82	.85	1.07*	.78	1.00	.92	UB/UINF	1.04	1.00	1.04	.94	.93	1.04	1.08	R= 8.03
UINF= 38.6 M/SEC	.04	.03	.04	.09	-.00	.11	-.07	VB/UINF	-.01	-.04	.08	-.03	.02	-.08	-.00	UINF= 39.0 M/SEC
X/D= 6.00	.59	.82	1.00	.93	1.22	.84	.83	WB/UINF	.54	.62	.72	.77	.74	.64	.57	X/D= 12.00
Z/D= 8.00	-.03	-.12	-.53	-1.28	-.16	-.90	-.49	CP	-.48	-.63	-.59	-.67	-.57	-.74	-.66	Z/D= 11.00
PHI= 30.0 DEG	.08	.22	.22	-.25	.94	-.18	.04	CPT	-.11	-.23	.03	-.19	-.16	-.22	-.17	PHI= 21.0 DEG
R= 8.06	.80	.84	1.03	.96*	.85	1.03	1.00	UB/UINF	.94	1.02	1.05	.98	.93	1.12	.82	R= 8.06
UINF= 38.5 M/SEC	-.03	-.09	.00	-.10	-.13	.01	-.08	VB/UINF	.08	.06	.08	.04	.01	.02	-.16	UINF= 39.1 M/SEC
X/D= 6.00	.56	.84	.90	1.01	1.16	.83	.71	WB/UINF	.55	.59	.67	.76	.72	.62	.56	X/D= 12.00
Z/D= 8.00	.10	-.20	-1.04	-1.03	-.52	-.89	-.46	CP	-.30	-.65	-.72	-.67	-.64	-.71	-.27	Z/D= 11.00
PHI= 30.0 DEG	.06	.22	-.15	-.07	.58	-.13	.07	CPT	-.12	-.25	-.16	-.12	-.25	-.07	-.26	PHI= 21.0 DEG
R= 8.06	.95	.93	.87	.88	.91	1.08	1.11	UB/UINF	.98	1.00	.97	1.02	.99	1.04	.96	R= 8.04
UINF= 39.2 M/SEC	.07	.16	.15	.05	-.03	.01	-.02	VB/UINF	.02	.03	.11	-.07	-.01	.05	-.04	UINF= 39.2 M/SEC
X/D= 8.00	.46	.61	.89	.95	.98	.82	.63	WB/UINF	.48	.57	.63	.65	.54	.57	.51	X/D= 15.18
Z/D= 9.00	-.30	-.51	-.60	-.75	-.93	-1.09	-1.11	CP	-.40	-.42	-.48	-.52	-.64	-.50	-.36	Z/D= 11.98
PHI= 26.0 DEG	-.18	-.23	-.03	-.06	-.12	-.25	-.47	CPT	-.21	-.09	-.14	-.03	-.37	-.09	-.17	PHI= 20.0 DEG
R= 8.07	.96	.81	.97	.92	.94	.92	.93	UB/UINF	.99	.98	1.06	1.12	.83	1.00	1.07	R= 8.03
UINF= 39.2 M/SEC	.08	.13	.01	-.00	.02	.04	-.14	VB/UINF	-.01	-.06	.13	.03	-.13	-.01	.03	UINF= 39.2 M/SEC
X/D= 8.00	.47	.71	.81	.87	.97	.82	.74	WB/UINF	.53	.56	.57	.62	.65	.54	.39	X/D= 15.18
Z/D= 9.00	-.32	-.32	-.80	-.94	-.93	-1.05	-.74	CP	-.37	-.43	-.68	-.76	-.41	-.57	-.70	Z/D= 11.98
PHI= 26.0 DEG	-.17	-.15	-.21	-.33	-.10	-.52	-.29	CPT	-.11	-.16	-.20	-.11	-.26	-.27	-.40	PHI= 20.0 DEG

TABLE C2.- Continued

(f) R = 8. Continued.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 8.03	.96	.97	1.03	1.04	1.11	.96	1.13	UB/UINF
UINF= 39.0 M/SEC	-.00	.08	-.00	.01	-.00	.00	-.04	VB/UINF
X/D= 18.00	.49	.54	.60	.54	.47	.44	.28	WB/UINF
Z/D= 13.00	-.21	-.30	-.37	-.49	-.48	-.39	-.56	CP
PHI= 18.0 DEG	-.01	-.05	.06	-.11	-.02	-.28	-.19	CPT
R= 8.03	.94	1.02	.97	1.06	.92	1.06	.97	UB/UINF
UINF= 39.0 M/SEC	.01	.10	.04	.03	.05	.01	-.07	VB/UINF
X/D= 18.00	.52	.50	.62	.55	.53	.51	.41	WB/UINF
Z/D= 13.00	-.15	-.38	-.25	-.35	-.34	-.33	-.18	CP
PHI= 18.0 DEG	.01	-.07	.08	.08	-.20	.05	-.06	CPT
R= 8.03	1.03	1.02	1.01	1.07	1.02	1.02	1.03	UB/UINF
UINF= 38.6 M/SEC	.02	.05	-.02	-.00	-.07	-.08	-.03	VB/UINF
X/D= 25.00	.45	.45	.43	.34	.25	.19	.07	WB/UINF
Z/D= 16.00	-.34	-.33	-.32	-.38	-.34	-.21	-.29	CP
PHI= 15.2 DEG	-.08	-.09	-.11	-.11	-.22	-.13	-.23	CPT
R= 8.04	1.01	1.10	1.07	1.06	1.02	1.09	1.01	UB/UINF
UINF= 38.7 M/SEC	.07	-.05	-.03	-.03	-.06	-.03	-.09	VB/UINF
X/D= 25.00	.45	.41	.40	.36	.27	.18	.13	WB/UINF
Z/D= 16.00	-.37	-.42	-.42	-.44	-.27	-.35	-.22	CP
PHI= 15.2 DEG	-.14	-.04	-.11	-.18	-.16	-.13	-.18	CPT
R= 8.05	1.04	1.00*	1.05	1.05	1.01	1.03	1.09	UB/UINF
UINF= 38.7 M/SEC	.01	-.00	-.04	-.02	-.03	-.04	-.04	VB/UINF
X/D= 35.00	.30	.28	.33	.28	.17	.16	.11	WB/UINF
Z/D= 18.00	-.23	-.14	-.22	-.23	-.15	-.21	-.26	CP
PHI= 14.9 DEG	-.06	-.06	-.00	-.05	-.09	-.11	-.05	CPT
R= 8.07	1.04	1.06	1.07	1.02	1.07	1.08*	1.05	UB/UINF
UINF= 38.6 M/SEC	.02	-.01	-.01	-.04	-.02	-.00	-.06	VB/UINF
X/D= 35.00	.32	.32	.32	.32	.20	.07	.10	WB/UINF
Z/D= 18.00	-.23	-.21	-.26	-.15	-.23	-.21	-.26	CP
PHI= 14.9 DEG	-.04	.01	-.00	-.00	-.04	-.04	-.15	CPT
R= 8.05	1.06	1.05*	1.06	1.09	1.02	1.02	1.06	UB/UINF
UINF= 38.8 M/SEC	-.01	-.01	-.01	-.02	-.03	-.01	-.04	VB/UINF
X/D= 35.00	.33	.27	.31	.27	.18	.18	.06	WB/UINF
Z/D= 18.00	-.18	-.23	-.18	-.29	-.20	-.19	-.23	CP
PHI= 14.9 DEG	.06	-.04	.03	-.03	-.12	-.11	-.10	CPT
R= 8.04	1.04	1.02	1.05	1.03*	1.00	1.03*	1.05	UB/UINF
UINF= 39.0 M/SEC	-.01	.00	-.03	-.01	-.02	.01	-.02	VB/UINF
X/D= 45.00	.26	.28	.29	.29	.22	.06	.11	WB/UINF
Z/D= 19.50	-.14	-.20	-.17	-.12	-.12	-.15	-.14	CP
PHI= 10.7 DEG	.03	-.07	.02	.03	-.07	-.08	-.02	CPT

	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
UB/UINF	1.04	1.02	1.04	1.05	.98	.96	1.06	R= 8.03
VB/UINF	-.04	.01	-.01	-.05	.01	-.02	-.00	UINF= 39.1 M/SEC
WB/UINF	.27	.30	.27	.27	.21	.22	.14	X/D= 45.00
CP	-.13	-.15	-.18	-.18	-.17	-.17	-.21	Z/D= 19.50
CPT	.04	-.01	-.02	-.01	-.17	-.20	-.06	PHI= 10.7 DEG

TABLE C2.- Continued

(f) R = 8. Concluded.

TEST CONDITIONS	ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5		ZB/D -1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	TEST CONDITIONS
R= 10.03	.48	.79	.77	1.04	1.19	2.69	4.61*	UB/UINF	.88	.77	.75	.80	.89	2.34	4.72*	R= 10.04
UINF= 24.6 M/SEC	-.07	-.16	-.54	-.39	.00	.19	.03	VB/UINF	-.00	-.13	-.05	-.20	-.19	.14	.16	UINF= 30.8 M/SEC
X/D= 2.00	.55	.73	1.33	1.52	1.23	.74	1.40	WB/UINF	.47	.89	1.40	1.70	1.47	.76	1.26	X/D= 2.03
Z/D= 6.00	-.18	-1.16	-1.69	-3.62	-4.14	-6.32	-9.20	CP	-.53	-1.06	-2.20	-3.05	-2.96	-5.63	-9.46	Z/D= 6.00
PHI= 52.0 DEG	-.64	-.98	-.04	-1.07	-2.20	.58	13.76	CPT	-.53	-.67	-.67	-.47	-.94	-.46	14.70	PHI= 51.9 DEG
R= 10.01	.62	.95	.78	.90	1.54	2.55	4.45*	UB/UINF	.86	.61	.79	.86	1.19	2.25	4.45*	R= 10.00
UINF= 24.5 M/SEC	.06	.01	-.37	-.26	-.20	.07	.06	VB/UINF	.19	.33	-.42	-.42	-.29	.08	.08	UINF= 30.9 M/SEC
X/D= 2.00	.59	.73	1.36	1.54	.95	.84	1.48	WB/UINF	.32	.96	1.49	1.55	1.20	.77	1.35	X/D= 2.03
Z/D= 6.00	-.20	-1.30	-1.49	-3.34	-4.76	-6.02	-7.44	CP	-.39	-.60	-1.95	-3.53	-3.97	-5.43	-8.20	Z/D= 6.00
PHI= 52.0 DEG	-.46	-.85	.11	-1.06	-2.42	.30	14.21	CPT	-.51	-.20	.08	-1.20	-2.01	-.70	13.49	PHI= 51.9 DEG
R= 10.04	.92	.51	.87	1.07	1.02	2.26	5.00*	UB/UINF	1.02	1.43	1.25	1.90	2.97	3.59	2.87	R= 10.02
UINF= 24.7 M/SEC	-.06	-.09	.25	.12	-.18	.17	.18	VB/UINF	-.05	-.09	.04	.09	.14	.20	.15	UINF= 30.8 M/SEC
X/D= 2.03	.37	1.14	1.33	1.62	1.43	.80	1.17	WB/UINF	1.32	1.13	1.18	.60	.61	.92	.59	X/D= 2.00
Z/D= 6.00	-.67	-.25	-2.55	-3.53	-3.20	-5.21	-10.95	CP	-2.14	-3.54	-2.61	-3.43	-3.78	-3.86	-3.31	Z/D= 8.00
PHI= 51.9 DEG	-.67	.32	-.94	-.73	-1.06	-.39	15.47	CPT	-.32	-1.20	-.63	-.40	4.62	9.31	4.45	PHI= 52.2 DEG
R= 10.05	.63	.93	.81	.90	1.15	2.44	4.61*	UB/UINF	.94	1.24	1.24	1.68	2.81	3.55	2.84	R= 9.99
UINF= 24.7 M/SEC	-.09	.08	-.42	-.48	-.02	.12	.15	VB/UINF	-.24	-.00	.04	.16	.14	.19	.09	UINF= 30.8 M/SEC
X/D= 2.03	.48	.84	1.38	1.60	1.35	.73	1.30	WB/UINF	1.35	1.24	1.20	.67	.58	.89	.76	X/D= 2.00
Z/D= 6.00	-.52	-1.28	-1.86	-2.64	-3.57	-6.20	-9.50	CP	-1.71	-3.21	-2.50	-3.09	-3.60	-3.55	-3.11	Z/D= 8.00
PHI= 51.9 DEG	-.88	-.70	-.10	-.01	-1.41	-.64	13.21	CPT	.08	-1.10	-.50	-.76	3.83	9.29	4.73	PHI= 52.2 DEG
R= 10.05	.95	1.03	1.00	1.13	.93*	1.17	1.44	UB/UINF	.83	1.13	1.02	.86	1.23	1.09	1.83	R= 9.95
UINF= 24.5 M/SEC	-.13	-.09	-.14	-.25	-.13	-.07	.05	VB/UINF	-.13	-.12	.01	-.18	-.04	.04	.05	UINF= 30.6 M/SEC
X/D= 6.00	.58	.89	.98	.98	1.19	.75	.53	WB/UINF	.72	.83	1.08	1.39	1.13	.99	.54	X/D= 4.00
Z/D= 9.98	-.68	-1.03	-1.46	-1.86	-1.01	-1.76	-1.88	CP	-.51	-1.76	-2.19	-1.50	-2.34	-1.98	-2.64	Z/D= 8.48
PHI= 34.8 DEG	-.42	-.18	-.47	-.56	.31	-.81	-.52	CPT	-.28	-.77	-.98	.23	-.51	-.78	.04	PHI= 41.0 DEG
R= 10.05	.95	.99	.95	1.12	1.07	1.13	.73*	UB/UINF	.69	1.03	.97	1.07	1.21	1.29	1.68	R= 9.94
UINF= 24.5 M/SEC	-.10	-.12	-.38	.14	-.01	.11	.08	VB/UINF	-.04	-.22	-.11	.05	.03	-.03	.03	UINF= 30.6 M/SEC
X/D= 6.00	.55	.75	.88	.87	1.03	.84	.82	WB/UINF	.75	.87	1.16	1.20	1.18	.89	.55	X/D= 4.00
Z/D= 9.98	-.88	-1.07	-1.46	-2.13	-1.31	-1.65	-.76	CP	-.40	-1.35	-1.74	-2.31	-2.13	-2.29	-2.41	Z/D= 8.48
PHI= 34.8 DEG	-.66	-.53	-.62	-1.10	-.09	-.64	-.53	CPT	-.35	-.48	-.42	-.72	-.27	-.83	-.26	PHI= 41.0 DEG
R= 10.05	.95*	.98	1.19	1.07	1.22	1.10	1.15	UB/UINF	.87	.87	1.00	.99	.97	1.22*	1.19	R= 9.99
UINF= 25.3 M/SEC	.05	-.02	.01	-.04	-.05	.08	-.03	VB/UINF	-.07	-.14	-.33	-.14	-.09	-.04	.04	UINF= 30.8 M/SEC
X/D= 14.00	.55	.51	.54	.56	.48	.52	.31	WB/UINF	.65	.86	.95	1.08	1.12	.77	.75	X/D= 6.00
Z/D= 14.00	-.35	-.59	-.85	-.85	-.82	-.86	-.77	CP	-.57	-.83	-1.46	-1.37	-1.33	-1.67	-1.23	Z/D= 9.98
PHI= 25.0 DEG	-.13	-.38	-.14	-.40	-.09	-.39	-.35	CPT	-.39	-.29	-.43	-.19	-.11	-.57	-.21	PHI= 34.8 DEG
R= 10.07	1.09	.96	1.07	.70*	1.13	1.04	1.06	UB/UINF	.91	1.00	.94	1.11*	1.02	1.18	1.30	R= 9.97
UINF= 25.1 M/SEC	.11	-.16	-.07	-.12	.04	-.02	-.04	VB/UINF	.07	-.07	-.21	-.17	-.26	-.08	.06	UINF= 30.6 M/SEC
X/D= 14.00	.48	.57	.53	.75	.51	.43	.49	WB/UINF	.65	.90	1.01	1.01	1.09	.87	.64	X/D= 6.00
Z/D= 14.00	-.47	-.55	-.94	-.18	-.93	-.55	-.55	CP	-.48	-.84	-1.29	-1.80	-1.44	-1.77	-1.61	Z/D= 9.98
PHI= 25.0 DEG	-.04	-.27	-.50	-.13	-.40	-.28	-.18	CPT	-.21	-.02	-.34	-.49	-.14	-.62	-.51	PHI= 34.8 DEG

TABLE C2.- Continued

(g) R = 10.

TEST CONDITIONS	ZB/D							
	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
R= 9.96	.95	1.08	1.03	1.09	1.04	1.01	.70	UB/UINF
UINF= 31.3 M/SEC	.06	-.08	-.06	.15	-.18	-.02	.10	VB/UINF
X/D= 8.00	.62	.64	.77	.91	.88	.84	.90	WB/UINF
Z/D= 11.00	-.21	-.80	-1.00	-1.34	-1.23	-1.11	-.16	CP
PHI= 31.0 DEG	.08	-.21	-.34	-.30	-.32	-.37	.16	CPT
R= 10.00	.98	1.10	.91	.93	.80	1.06	1.23	UB/UINF
UINF= 31.4 M/SEC	-.08	.04	.07	-.17	.10	.13	.08	VB/UINF
X/D= 8.00	.51	.61	.92	1.02	1.12	.85	.68	WB/UINF
Z/D= 11.00	-.29	-.93	-.68	-.80	-.42	-1.12	-1.23	CP
PHI= 31.0 DEG	-.06	-.33	.01	.15	.50	-.27	-.25	CPT
R= 9.98	.94	.98	1.04	1.05	.89	1.09	1.08	UB/UINF
UINF= 31.4 M/SEC	-.08	.14	-.08	.01	-.13	.03	-.03	VB/UINF
X/D= 10.00	.51	.62	.72	.81	.95	.75	.61	WB/UINF
Z/D= 11.98	-.45	-.67	-.92	-1.05	-.73	-1.13	-.89	CP
PHI= 28.0 DEG	-.29	-.29	-.30	-.29	-.01	-.38	-.36	CPT
R= 9.96	1.04	1.02	1.07	1.05	.87	.90	1.14	UB/UINF
UINF= 31.4 M/SEC	-.06	-.02	-.09	-.04	.03	.08	.09	VB/UINF
X/D= 10.00	.46	.63	.78	.82	.97	.83	.53	WB/UINF
Z/D= 11.98	-.54	-.62	-1.00	-.87	-.71	-.90	-1.08	CP
PHI= 28.0 DEG	-.24	-.19	-.23	-.08	.01	-.40	-.48	CPT
R= 9.99	.94	.93	.99	1.08	1.24*	1.03	1.20	UB/UINF
UINF= 31.2 M/SEC	-.02	.01	-.11	-.02	-.04	.04	-.01	VB/UINF
X/D= 12.08	.67	.79	.80	.76	.56	.62	.35	WB/UINF
Z/D= 13.50	-.43	-.49	-.72	-.94	-1.04	-.83	-.89	CP
PHI= 25.0 DEG	-.10	-.00	-.10	-.18	-.18	-.38	-.33	CPT
R= 10.01	1.10	.93	.99	.82	1.18	.98	.91	UB/UINF
UINF= 31.2 M/SEC	-.09	-.02	-.02	-.04	-.02	.00	-.08	VB/UINF
X/D= 12.08	.58	.72	.75	.89	.72	.59	.56	WB/UINF
Z/D= 13.50	-.75	-.64	-.69	-.39	-.88	-.65	-.41	CP
PHI= 25.0 DEG	-.19	-.25	-.14	.09	.03	-.33	-.27	CPT
R= 9.97	1.05	.98	.97	1.10*	1.09	1.04	.85	UB/UINF
UINF= 31.6 M/SEC	.02	-.09	.04	-.14	-.05	.00	-.04	VB/UINF
X/D= 14.00	.54	.67	.64	.58	.67	.60	.51	WB/UINF
Z/D= 14.00	-.40	-.45	-.65	-.89	-.77	-.78	-.36	CP
PHI= 25.0 DEG	-.01	-.02	-.30	-.32	-.14	-.33	-.38	CPT
R= 9.98	1.03	1.02	1.03	.94	1.01	1.12	1.12	UB/UINF
UINF= 31.5 M/SEC	.05	.03	.01	-.01	-.08	.03	.02	VB/UINF
X/D= 14.00	.52	.64	.62	.67	.66	.59	.52	WB/UINF
Z/D= 14.00	-.44	-.50	-.67	-.74	-.78	-.82	-.72	CP
PHI= 25.0 DEG	-.11	-.04	-.21	-.39	-.32	-.20	-.20	CPT

	ZB/D							TEST CONDITIONS
	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	
UB/UINF	1.03	.97	1.05	.80*	1.16	1.03	1.02	R= 9.99
VB/UINF	-.05	-.02	.04	-.02	.03	-.01	-.05	UINF= 31.3 M/SEC
WB/UINF	.58	.59	.60	.68	.43	.39	.30	X/D= 18.00
CP	-.34	-.27	-.46	-.04	-.58	-.39	-.31	Z/D= 16.00
CPT	.07	.01	.02	.07	-.05	-.17	-.18	PHI= 22.0 DEG
UB/UINF	1.07	1.09	1.13	.95	.99	.92	1.09*	R= 9.98
VB/UINF	.10	.01	.04	.06	.00	.03	.03	UINF= 31.3 M/SEC
WB/UINF	.51	.57	.53	.58	.45	.37	.42	X/D= 18.00
CP	-.49	-.43	-.56	-.39	-.32	-.29	-.39	Z/D= 16.00
CPT	-.07	.09	.01	-.14	-.14	-.30	-.03	PHI= 22.0 DEG

TABLE C2.- Concluded

(g) R = 10. Concluded.

X/D = 2.00 R = 3.16 UINF = 51.2 M/SEC
Z/D = 2.00 PHI = 22.0 DEG

ZB/D \ YB/D	0.00	.26	.50	.75	1.01	1.25	1.51	
1.5	1.53	1.51	1.29	1.18	1.07	.89	.92	UB/UINF
	.07	.19	.26	.28	.37	.35	.31	VB/UINF
	.34	.32	.28	.06	-.10	-.27	-.33	WB/UINF
	-.61	-.70	-.34	-.45	-.28	-.02	-.00	CP
	.87	.75	.50	.04	.03	-.02	.05	CPT
1.0	1.89	1.96	1.87	1.95	1.84	1.40	1.07	UB/UINF
	.09	.19	.29	.36	.43	.45	.43	VB/UINF
	.31	.30	.28	.24	.18	-.08	-.34	WB/UINF
	-1.69	-1.71	-1.5[illegible]	-1.37	-1.24	-.80	-.35	CP
	1.07	1.36	1.14	1.71	1.45	.42	.12	CPT
.5	.23	.33	.26	.72	1.36	1.69	1.45	UB/UINF
	-.05	-.01	.01	.12	.19	.41	.39	VB/UINF
	.22	.11	-.01	-.08	-.12	-.12	-.27	WB/UINF
	-1.22	-1.28	-1.32	-1.48	-1.67	-1.46	-1.04	CP
	-2.12	-2.15	-2.25	-1.94	-.74	.62	.31	CPT
0.0	.24	.21$	.14$	.05$	.43	1.05	1.38	UB/UINF
	-.01	-.00	-.09	.03	-.04	.14	.21	VB/UINF
	.64	.63	.61	.24	-.19	-.43	-.46	WB/UINF
	-1.20	-1.16	-1.05	-1.46	-1.53	-1.50	-1.28	CP
	-1.73	-1.72	-1.64	-2.40	-2.31	-1.18	-.10	CPT
-.5	.44	.47	.42	.50	.45	1.09	1.17	UB/UINF
	-.10	.06	-.21	-.39	-.38	-.22	-.08	VB/UINF
	.87	.88	.62	.27	-.09	-.43	-.66	WB/UINF
	-1.10	-1.19	-1.46	-1.51	-1.44	-1.45	-1.04	CP
	-1.14	-1.19	-1.86	-2.03	-2.08	-1.01	-.20	CPT
-1.0	.62	.66	.78	.78	.75	1.06	1.06	UB/UINF
	.07	-.15	-.26	-.43	-.52	-.37	-.39	VB/UINF
	.68	.63	.46	.22	-.25	-.46	-.54	WB/UINF
	-.78	-.73	-1.00	-.99	-.84	-.89	-.58	CP
	-.93	-.87	-1.12	-1.14	-.95	-.42	-.01	CPT
-1.5	.70	.70	.91	1.01	1.00	1.04	1.03	UB/UINF
	.15	-.18	-.19	-.34	-.41	-.39	-.33	VB/UINF
	.15	.14	.05	-.13	-.26	-.44	-.44	WB/UINF
	-.46	-.42	-.52	-.55	-.40	-.40	-.34	CP
	-.91	-.88	-.66	-.40	-.16	.03	.03	CPT

X/D = 6.00 R = 3.18 UINF = 52.7 M/SEC
Z/D = 3.00 PHI = 12.9 DEG

ZB/D \ YB/D	0.00	.51	1.03	1.54	2.04	
1.5	1.04	1.05	1.14	1.15	1.07	UB/UINF
	-.01	.12	.19	.20	.22	VB/UINF
	-.04	-.10	-.14	-.19	-.26	WB/UINF
	-.40	-.40	-.35	-.28	-.16	CP
	-.31	-.28	.01	.12	.11	CPT
1.0	.68	.73	.89	1.11	1.13	UB/UINF
	-.06	.06	.13	.14	.18	VB/UINF
	.06	.04	-.08	-.19	-.27	WB/UINF
	-.41	-.35	-.47	-.40	-.30	CP
	-.94	-.81	-.64	-.11	.09	CPT
.5	.51	.59	.67	.86	1.08	UB/UINF
	-.01	.03	.12	.11	.14	VB/UINF
	.25	.29	-.06	-.23	-.34	WB/UINF
	-.37	-.41	-.48	-.46	-.32	CP
	-1.06	-.97	-1.01	-.64	-.01	CPT
0.0	.65	.65	.64	.80	1.09	UB/UINF
	-.04	.01	.04	-.02	.02	VB/UINF
	.34	.31	.02	-.27	-.37	WB/UINF
	-.43	-.43	-.52	-.38	-.41	CP
	-.89	-.90	-1.11	-.66	-.06	CPT
-.5	.80	.80	.88	.85	1.04	UB/UINF
	.05	-.08	-.13	-.16	-.09	VB/UINF
	.34	.35	.01	-.27	-.36	WB/UINF
	-.37	-.35	-.43	-.36	-.27	CP
	-.62	-.57	-.63	-.52	-.03	CPT
-1.0	.85	.81	.92	1.02	1.00	UB/UINF
	.07	-.13	-.17	-.14	-.19	VB/UINF
	.28	.22	-.03	-.22	-.34	WB/UINF
	-.26	-.22	-.33	-.36	-.19	CP
	-.46	-.49	-.44	-.23	-.02	CPT
-1.5	.89	.87	.98	.97	.98	UB/UINF
	.08	-.14	-.18	-.23	-.16	VB/UINF
	.09	.10	-.08	-.21	-.28	WB/UINF
	-.19	-.11	-.17	-.13	-.12	CP
	-.38	-.33	-.17	-.08	-.04	CPT

TABLE C3.- CROSS-SECTION VELOCITIES AND PRESSURES

(a) R = 3.

X/D = 8.00 R = 3.17 UINF = 52.8 M/SEC PINF = .100E+06 N/M**2
Z/D = 3.00 PHI = 13.0 DEG Q = .171E+04 N/M**2

ZB/D \ YB/D	0.00	.49	1.00	1.49	1.99	
1.5	.81	.83	.90	.97	1.10	UB/UINF
	-.00	.06	.14	.16	.15	VB/UINF
	.03	-.05	-.16	-.20	-.26	WB/UINF
	-.29	-.27	-.28	-.26	-.27	CP
	-.63	-.57	-.42	-.25	.04	CPT
1.0	.65	.71	.70	.75	.97	UB/UINF
	-.02	.06	.09	.11	.15	VB/UINF
	.12	.03	-.02	-.21	-.29	WB/UINF
	-.26	-.27	-.24	-.22	-.23	CP
	-.82	-.77	-.75	-.60	-.17	CPT
.5	.73	.83	.68	.86	.98	UB/UINF
	-.02	.06	.05	.07	.06	VB/UINF
	.23	.18	.00	-.19	-.32	WB/UINF
	-.24	-.39	-.29	-.35	-.28	CP
	-.65	-.66	-.82	-.56	-.21	CPT
0.0	.75	.61	.86	.87	1.05	UB/UINF
	.02	.04	-.04	-.04	-.03	VB/UINF
	.32	.22	.02	-.18	-.29	WB/UINF
	-.19	-.32	-.36	-.32	-.35	CP
	-.53	-.61	-.62	-.53	-.15	CPT
-.5	.88	.84	.89	.97	.93	UB/UINF
	.02	-.07	-.08	-.09	-.13	VB/UINF
	.22	.21	-.02	-.12	-.30	WB/UINF
	-.21	-.21	-.23	-.27	-.13	CP
	-.38	-.45	-.42	-.30	-.14	CPT
-1.0	.89	.88	1.02	.97	.97	UB/UINF
	.08	-.07	-.08	-.20	-.15	VB/UINF
	.08	.08	-.03	-.16	-.29	WB/UINF
	-.16	-.10	-.25	-.12	-.11	CP
	-.35	-.32	-.20	-.10	-.06	CPT
-1.5	.91	.98	1.01	1.02	.98	UB/UINF
	.08	-.02	-.07	-.14	-.14	VB/UINF
	-.02	-.02	-.09	-.20	-.25	WB/UINF
	-.13	-.15	-.13	-.09	-.04	CP
	-.29	-.18	-.09	.01	.01	CPT

TABLE C3.- Continued

(a) R = 3. Concluded.

X/D = 2.03 R = 4.12 UINF = 38.2 M/SEC
Z/D = 2.50 PHI = 28.0 DEG

ZB/D \ YB/D	0.00	.26	.50	.75	1.00	1.25	1.50	
1.5	2.44	2.26	2.22	1.93	1.59	1.06	.99	UB/UINF
	.09	.24	.39	.44	.46	.50	.48	VB/UINF
	.62	.60	.50	.46	.26	-.18	-.31	WB/UINF
	-2.29	-1.83	-1.96	-1.55	-1.25	-.57	-.45	CP
	3.18	2.78	2.47	1.62	.59	-.17	-.14	CPT
1.0	1.17	1.33	1.62	1.94	2.18	1.90	1.58	UB/UINF
	.06	.15	.30	.29	.39	.63	.64	VB/UINF
	.21	.13	.19	.26	.23	.13	-.09	WB/UINF
	-2.04	-2.17	-2.19	-2.35	-2.43	-1.61	-1.30	CP
	-1.62	-1.35	-.43	.61	1.60	1.47	.64	CPT
.5	.18$	.21	.11$	.75	1.18	1.92	1.93	UB/UINF
	-.05	.12	.32	.23	.18	.44	.52	VB/UINF
	.72	.41	.37	-.09	-.08	.03	-.10	WB/UINF
	-1.08	-1.68	-1.64	-2.14	-2.22	-2.41	-2.04	CP
	-1.52	-2.46	-2.39	-2.51	-1.78	.53	1.04	CPT
0.0	.33	.25$	.35	.46	1.16	1.68	1.76	UB/UINF
	-.07	.02	-.07	.01	-.09	.21	.25	VB/UINF
	.80	1.00	.50	.49	-.06	-.23	-.33	WB/UINF
	-1.82	-1.29	-2.19	-2.08	-2.50	-2.40	-2.38	CP
	-2.06	-1.24	-2.81	-2.62	-2.14	-.44	-.06	CPT
-.5	.46	.41	.77	.96	1.10	1.35	1.33	UB/UINF
	-.05	-.38	-.39	-.46	-.27	-.19	-.16	VB/UINF
	.86	.84	.49	.32	-.04	-.45	-.58	WB/UINF
	-1.59	-1.43	-2.16	-2.01	-2.04	-1.97	-1.69	CP
	-1.63	-1.42	-2.18	-1.75	-1.75	-.90	-.53	CPT
-1.0	.63	.51	1.02	.84	1.13	1.16	1.08	UB/UINF
	.10	-.35	-.37	-.45	-.47	-.41	-.47	VB/UINF
	.53	.48	.31	.07	-.06	-.40	-.52	WB/UINF
	-1.40	-1.33	-1.47	-1.09	-1.24	-1.08	-.84	CP
	-1.71	-1.71	-1.19	-1.16	-.72	-.40	-.16	CPT
-1.5	.64	.71	.81	.72	.98	.99	.80	UB/UINF
	.08	-.24	-.33	-.46	-.38	-.37	-.43	VB/UINF
	.13	.11	-.05	-.09	-.30	-.45	-.54	WB/UINF
	-1.22	-1.13	-.90	-.61	-.65	-.44	-.19	CP
	-1.78	-1.55	-1.13	-.87	-.44	-.11	-.07	CPT

X/D = 1.97 R = 4.14 UINF = 38.3 M/SEC
Z/D = 4.25 PHI = 28.0 DEG

ZB/D \ YB/D	0.00	.26	.50	.75	1.00	
1.5	.86	.86	.85	.85	.85	UB/UINF
	.05	.09	.10	.14	.17	VB/UINF
	-.31	-.31	-.30	-.33	-.35	WB/UINF
	.21	.20	.20	.19	.21	CP
	.06	.04	.03	.04	.08	CPT
1.0	.88	.88	.89	.89	.87	UB/UINF
	.03	.10	.12	.18	.17	VB/UINF
	-.17	-.19	-.22	-.25	-.28	WB/UINF
	.14	.15	.13	.16	.17	CP
	-.05	-.04	-.00	.04	.03	CPT
.5	1.31	1.31	1.19	1.06	.98	UB/UINF
	.03	.12	.22	.27	.29	VB/UINF
	.13	.06	.01	-.06	-.20	WB/UINF
	-.47	-.47	-.30	-.20	-.11	CP
	.26	.28	.17	.00	-.03	CPT
0.0	1.95	1.97	1.82	1.79	1.53	UB/UINF
	.05	.17	.23	.32	.43	VB/UINF
	.26	.19	.23	.19	.09	WB/UINF
	-1.32	-1.43	-1.19	-1.12	-.87	CP
	1.61	1.58	1.28	1.28	.68	CPT
-.5	.99	1.11	1.20	1.72	1.74	UB/UINF
	.04	.09	.14	.27	.31	VB/UINF
	.01	-.01	-.07	-.05	-.04	WB/UINF
	-1.34	-1.44	-1.38	-1.58	-1.50	CP
	-1.35	-1.19	-.90	.49	.66	CPT
-1.0	.16$	.34	.38	.72	1.08	UB/UINF
	-.00	.10	.16	.19	.18	VB/UINF
	.52	.35	.12	-.17	-.13	WB/UINF
	-1.04	-1.31	-1.44	-1.57	-1.61	CP
	-1.74	-2.06	-2.26	-1.99	-1.39	CPT
-1.5	.35	.51	.36	.50	1.01	UB/UINF
	-.03	.06	-.15	-.12	-.03	VB/UINF
	.75	.59	.68	.16	-.21	WB/UINF
	-1.10	-1.58	-1.27	-1.57	-1.70	CP
	-1.41	-1.96	-1.66	-2.28	-1.64	CPT

TABLE C3.- Continued

(b) R = 4.

X/D = 2.66　　R = 4.00　　UINF = 38.7 M/SEC
Z/D = 4.63　　　　　　　　PHI = 31.8 DEG

ZB/D \ YB/D	-2.67	-1.13	-.62	-.10	.41	.93	1.44	1.96	2.48	
1.5	.84	.84	.82	.82	.83	.83	.81	.80	.81	UB/UINF
	-.03	-.05	-.02	-.00	.06	.13	.14	.15	.14	VB/UINF
	-.50	-.43	-.41	-.37	-.37	-.38	-.42	-.45	-.48	WB/UINF
	.26	.33	.35	.32	.28	.27	.27	.26	.25	CP
	.22	.22	.19	.14	.11	.12	.13	.14	.16	CPT
1.0	.86	.87	.89	.88	.90	.87	.86	.86	.84	UB/UINF
	-.08	-.13	-.11	-.04	.06	.15	.15	.18	.15	VB/UINF
	-.49	-.39	-.33	-.27	-.26	-.33	-.40	-.43	-.49	WB/UINF
	.19	.25	.23	.20	.16	.21	.21	.20	.19	CP
	.18	.17	.14	.06	.05	.10	.13	.15	.16	CPT
.5	.87	.94	1.10	1.21	1.19	1.03	.91	.86	.86	UB/UINF
	-.12	-.21	-.17	-.04	.11	.21	.21	.22	.17	VB/UINF
	-.53	-.35	-.22	-.09	-.12	-.22	-.37	-.47	-.50	WB/UINF
	.17	.06	-.08	-.20	-.24	-.10	.05	.15	.13	CP
	.23	.13	.20	.28	.19	.06	.07	.17	.15	CPT
0.0	.85	1.30	1.59	1.72	1.76	1.62	1.17	.99	.83	UB/UINF
	-.14	-.30	-.16	-.01	.11	.26	.33	.30	.22	VB/UINF
	-.57	-.27	-.14	-.08	-.08	-.11	-.28	-.48	-.55	WB/UINF
	.15	-.29	-.62	-.71	-.78	-.73	-.33	-.02	.13	CP
	.23	.57	.96	1.27	1.36	1.01	.24	.10	.18	CPT
-.5	.84	1.51	1.32	1.18	1.28	1.53	1.46	1.01	.85	UB/UINF
	-.13	-.21	-.07	.01	.09	.30	.35	.36	.22	VB/UINF
	-.63	-.32	-.30	-.15	-.23	-.25	-.31	-.50	-.62	WB/UINF
	.09	-.71	-.80	-.86	-.89	-.80	-.72	-.28	-.02	CP
	.20	.75	.05	-.45	-.17	.72	.64	.12	.14	CPT
-1.0	.80	1.31	.78	.42	.44	.97	1.37	1.18	.89	UB/UINF
	-.07	-.08	-.06	-.02	.11	.15	.22	.31	.20	VB/UINF
	-.71	-.35	-.11	.21	.01	-.26	-.37	-.52	-.66	WB/UINF
	.08	-.87	-.85	-.73	-.85	-.96	-.90	-.53	-.16	CP
	.23	-.01	-1.22	-1.51	-1.65	-.93	.18	.25	.11	CPT
-1.5	.89	.98	.57	.42	.48	.70	1.16	1.18	.81	UB/UINF
	-.04	-.01	.01	.03	.08	-.00	.11	.13	.11	VB/UINF
	-.68	-.34	.13	.50	.35	-.18	-.46	-.60	-.75	WB/UINF
	-.17	-.90	-.94	-.70	-.92	-1.01	-.99	-.72	-.17	CP
	.10	-.83	-1.59	-1.28	-1.56	-1.49	-.41	.05	.08	CPT

TABLE C3.- Continued

(b) R = 4. Continued. (This table is for upper part of cross section shown in fig. 13.)

X/D = 4.16   R = 4.00   UINF = 38.7 M/SEC
Z/D = 2.03   PHI = 31.8 DEG

ZB/D \ YB/D	-2.54	-1.03	-.53	-.02	.48	.98	1.49	1.99	2.50	
1.5	.76	.97	.56	.46	.43	.67	1.06	1.07	.84	UB/UINF
	.05	.08	.02	-.02	.02	.03	.11	.20	.16	VB/UINF
	-.73	-.29	.20	.49	.39	-.08	-.43	-.63	-.72	WB/UINF
	.01	-1.05	-1.02	-.81	-.89	-1.08	-.95	-.53	-.25	CP
	.11	-1.01	-1.66	-1.36	-1.55	-1.62	-.62	.06	.01	CPT
1.0	.82	.88	.78	.54	.62	.69	.97	.98	.85	UB/UINF
	.09	.18	.18	.07	-.13	-.11	-.04	.03	-.04	VB/UINF
	-.72	-.29	.20	.58	.37	-.01	-.40	-.67	-.73	WB/UINF
	-.18	-1.04	-1.05	-.71	-.93	-1.00	-.90	-.54	-.29	CP
	.04	-1.15	-1.36	-1.08	-1.39	-1.52	-.78	-.13	-.01	CPT
.5	.84	.94	.77	.75	.73	.85	.95	.94	.87	UB/UINF
	.18	.30	.31	.08	-.21	-.21	-.21	-.20	-.15	VB/UINF
	-.65	-.30	.18	.33	.21	-.09	-.49	-.67	-.71	WB/UINF
	-.17	-.68	-.76	-.77	-.81	-.84	-.68	-.48	-.21	CP
	.01	-.60	-1.05	-1.10	-1.19	-1.07	-.50	-.11	.08	CPT
0.0	.85	.94	.89	.61	.76	.89	.94	.91	.87	UB/UINF
	.23	.37	.27	.04	-.16	-.28	-.30	-.28	-.22	VB/UINF
	-.61	-.24	-.03	.17	.01	-.18	-.48	-.60	-.64	WB/UINF
	-.09	-.41	-.65	-.64	-.64	-.46	-.37	-.27	-.14	CP
	.06	-.32	-.77	-1.24	-1.03	-.55	-.17	.01	.09	CPT
-.5	.82	.83	.77	.70	.77	.86	.86	.89	.83	UB/UINF
	.25	.33	.23	.08	-.17	-.27	-.32	-.28	-.20	VB/UINF
	-.58	-.38	-.28	-.13	-.15	-.35	-.49	-.58	-.61	WB/UINF
	-.01	-.19	-.40	-.64	-.46	-.23	-.12	-.09	-.02	CP
	.07	-.23	-.67	-1.13	-.81	-.29	-.04	.11	.10	CPT
-1.0	.86	.81	.72	.66	.75	.87	.86	.88	.88	UB/UINF
	.22	.25	.16	.07	-.11	-.18	-.23	-.23	-.19	VB/UINF
	-.53	-.45	-.31	-.26	-.30	-.38	-.49	-.51	-.54	WB/UINF
	.00	-.06	-.33	-.62	-.42	-.23	-.05	-.03	-.02	CP
	.08	-.14	-.68	-1.11	-.76	-.29	-.01	.06	.08	CPT
-1.5	.88	.81	.66	.55	.65	.77	.86	.85	.87	UB/UINF
	.18	.19	.13	-.09	-.15	-.16	-.19	-.20	-.18	VB/UINF
	-.49	-.45	-.38	-.46	-.42	-.48	-.48	-.52	-.52	WB/UINF
	-.01	-.21	-.39	-.29	-.35	-.11	-.06	.01	-.00	CP
	.05	-.30	-.79	-.77	-.72	-.26	-.06	.04	.07	CPT

TABLE C3.- Continued

(b) R = 4. Continued. (This table is for lower half of cross section shown in fig. 13.)

X/D = 4.69 R = 4.01 UINF = 38.8 M/SEC
Z/D = 2.03 PHI = 31.8 DEG

ZB/D \ YB/D	-2.50	-1.00	-.50	0.00	.50	1.00	1.50	2.00	2.50	
1.5	.71	.85	.60	.57	.62	.68	.85	1.03	.80	UB/UINF
	.05	.10	.18	.08	.03	-.01	.06	.13	.10	VB/UINF
	-.77	-.23	.24	.49	.33	-.07	-.46	-.63	-.75	WB/UINF
	.09	-.82	-.75	-.68	-.87	-.92	-.65	-.50	-.12	CP
	.19	-1.03	-1.30	-1.11	-1.39	-1.45	-.71	-.02	.09	CPT
1.0	.86	.97	.79	.68	.63	.88	.97	.94	.85	UB/UINF
	.12	.19	.18	.10	-.15	-.09	-.07	-.03	-.06	VB/UINF
	-.69	-.21	.13	.36	.24	-.03	-.41	-.65	-.72	WB/UINF
	-.20	-.80	-.84	-.74	-.75	-.88	-.71	-.45	-.23	CP
	.02	-.78	-1.16	-1.15	-1.26	-1.09	-.60	-.14	.01	CPT
.5	.87	.98	.89	.69	.76	.92	.93	.90	.85	UB/UINF
	.19	.31	.24	.03	-.16	-.18	-.23	-.23	-.17	VB/UINF
	-.65	-.24	.06	.25	.10	-.14	-.44	-.66	-.69	WB/UINF
	-.14	-.52	-.70	-.63	-.66	-.65	-.55	-.29	-.16	CP
	.08	-.39	-.85	-1.09	-1.05	-.75	-.43	-.00	.07	CPT
0.0	.84	.92	.75	.66	.80	.89	.94	.88	.86	UB/UINF
	.25	.32	.24	.02	-.14	-.26	-.29	-.27	-.20	VB/UINF
	-.60	-.31	-.06	.07	-.07	-.22	-.44	-.59	-.62	WB/UINF
	-.01	-.28	-.47	-.58	-.57	-.34	-.24	-.13	-.07	CP
	.11	-.23	-.85	-1.15	-.91	-.43	-.07	.07	.09	CPT
-.5	.84	.8	.70	.57	.80	.88	.87	.85	.85	UB/UINF
	.23	.26	.20	.03	-.09	-.23	-.27	-.27	-.21	VB/UINF
	-.55	-.37	-.26	-.23	-.31	-.35	-.46	-.54	-.59	WB/UINF
	.01	-.17	-.41	-.53	-.42	-.21	-.08	-.01	-.00	CP
	.07	-.24	-.81	-1.15	-.68	-.26	-.03	.09	.11	CPT
-1.0	.85	.83	.83	.67	.72	.84	.87	.88	.87	UB/UINF
	.19	.22	.06	.01	-.13	-.16	-.21	-.19	-.17	VB/UINF
	-.51	-.41	-.34	-.33	-.32	-.45	-.47	-.51	-.53	WB/UINF
	.04	-.07	-.48	-.52	-.37	-.12	-.01	.01	.03	CP
	.07	-.17	-.67	-.96	-.73	-.18	.02	.09	.10	CPT
-1.5	.84	.77	.57	.57	.63	.82	.86	.86	.86	UB/UINF
	.17	.23	.12	-.02	-.11	-.13	-.17	-.19	-.16	VB/UINF
	-.51	-.44	-.46	-.50	-.50	-.49	-.49	-.50	-.53	WB/UINF
	.06	-.10	-.28	-.33	-.20	-.13	-.01	.04	.04	CP
	.06	-.25	-.72	-.75	-.54	-.19	.00	.07	.08	CPT

TABLE C3.- Continued

(b) R = 4. Continued. (This table is an extension of cross section shown in fig. 13.)

X/D = 5.20 R = 3.99 UINF = 38.8 M/SEC
Z/D = 5.81 PHI = 21.3 DEG

ZB/D \ YB/D	-.99	-.50	0.00	.50	.99	
	.95	.92	.94	.93	.94	UB/UINF
	-.04	-.01	.02	.04	.11	VB/UINF
1.5	-.29	-.28	-.26	-.27	-.28	WB/UINF
	.09	.13	.07	.12	.08	CP
	.08	.06	.03	.06	.06	CPT
	1.00	.99	1.03	1.01	.99	UB/UINF
	-.08	-.06	-.01	.05	.10	VB/UINF
1.0	-.25	-.22	-.17	-.20	-.21	WB/UINF
	.00	.00	-.08	-.03	-.02	CP
	.08	.05	.02	.03	.01	CPT
	1.14	1.17	1.21	1.17	1.11	UB/UINF
	-.11	-.05	-.01	.05	.12	VB/UINF
.5	-.21	-.16	-.12	-.16	-.15	WB/UINF
	-.15	-.19	-.20	-.16	-.18	CP
	.22	.22	.29	.24	.10	CPT
	1.20	1.32	1.31	1.29	1.20	UB/UINF
	-.16	-.07	.02	.07	.12	VB/UINF
0.0	-.19	-.15	-.13	-.13	-.18	WB/UINF
	-.24	-.30	-.32	-.37	-.26	CP
	.27	.49	.41	.34	.23	CPT
	1.27	1.17	1.05	1.10	1.27	UB/UINF
	-.11	-.10	.01	.07	.12	VB/UINF
-.5	-.18	-.14	-.14	-.13	-.20	WB/UINF
	-.45	-.43	-.48	-.43	-.45	CP
	.22	-.03	-.34	-.18	.23	CPT
	1.06	.88	.81	.86	.93	UB/UINF
	-.06	-.06	.01	.06	.13	VB/UINF
-1.0	-.21	-.10	.00	-.07	-.17	WB/UINF
	-.45	-.48	-.49	-.48	-.41	CP
	-.27	-.70	-.83	-.72	-.49	CPT
	.94	.75	.67	.66	.87	UB/UINF
	-.07	-.04	-.00	.16	.07	VB/UINF
-1.5	-.20	.04	.17	.05	-.09	WB/UINF
	-.56	-.56	-.52	-.51	-.54	CP
	-.63	-1.00	-1.05	-1.05	-.77	CPT

X/D = 6.00 R = 4.18 UINF = 38.4 M/SEC
Z/D = 4.00 PHI = 17.0 DEG

ZB/D \ YB/D	0.00	.44	.96	1.48	1.99	
	.99	1.25	1.08	1.35	1.21	UB/UINF
	-.01	.13	.22	.20	.25	VB/UINF
1.5	-.06	-.06	-.14	-.16	-.29	WB/UINF
	-.53	-.69	-.44	-.65	-.36	CP
	-.55	-.10	-.20	.25	.25	CPT
	.78	.92	.93	1.07	1.23	UB/UINF
	-.01	.02	.15	.20	.17	VB/UINF
1.0	.10	.06	-.08	-.21	-.24	WB/UINF
	-.57	-.60	-.55	-.51	-.56	CP
	-.95	-.74	-.66	-.27	.05	CPT
	.63	.75	.92	1.02	1.23	UB/UINF
	-.03	-.01	.04	.09	.13	VB/UINF
.5	.22	.19	-.04	-.18	-.35	WB/UINF
	-.58	-.64	-.64	-.61	-.52	CP
	-1.13	-1.03	-.78	-.51	.15	CPT
	.61	.65	.72	1.00	1.18	UB/UINF
	.00	-.15	-.04	.04	.04	VB/UINF
0.0	.39	.21	.05	-.19	-.32	WB/UINF
	-.45	-.59	-.59	-.65	-.57	CP
	-.93	-1.04	-1.06	-.61	-.08	CPT
	.66	.62	.85	1.12	1.07	UB/UINF
	.10	-.11	-.12	-.11	-.06	VB/UINF
-.5	.29	.27	.02	-.12	-.37	WB/UINF
	-.53	-.48	-.55	-.64	-.43	CP
	-1.00	-1.01	-.82	-.35	-.13	CPT
	.79	.78	.97	1.06	.96	UB/UINF
	.10	-.18	-.17	-.16	-.19	VB/UINF
-1.0	.17	.13	.01	-.17	-.42	WB/UINF
	-.61	-.53	-.45	-.41	-.24	CP
	-.94	-.87	-.47	-.24	-.10	CPT
	.71	.50	.89	.97	1.01	UB/UINF
	.04	-.22	-.22	-.22	-.22	VB/UINF
-1.5	.08	.16	-.06	-.15	-.29	WB/UINF
	-.58	-.24	-.32	-.20	-.24	CP
	-1.07	-.91	-.48	-.18	-.08	CPT

TABLE C3.- Continued

(b) R = 4. Continued.

X/D = 8.44 R = 4.00 UINF = 39.0 M/SEC
Z/D = 6.78 PHI = 11.0 DEG

ZB/D \ YB/D	-3.55	-2.54	-1.02	-.51	0.00	.51	1.02	1.53	2.04	2.55	3.56	
1.5	.99	.99	.97	.98	.99	.99	.99	.99	.97	.98	.98	UB/UINF
	-.04	-.05	-.05	-.04	-.02	.01	.03	.05	.06	.06	.04	VB/UINF
	-.21	-.19	-.14	-.14	-.13	-.14	-.14	-.15	-.16	-.18	-.20	WB/UINF
	.01	.02	.03	.03	.02	-.01	.00	.01	.03	.01	.01	CP
	.04	.05	.01	.02	.02	.00	.01	.01	.01	.02	.01	CPT
1.0	1.00	1.00	1.04	1.02	1.05	1.07	1.03	1.03	.98	.98	.98	UB/UINF
	-.04	-.06	-.07	-.05	-.01	.01	.03	.07	.09	.08	.07	VB/UINF
	-.20	-.17	-.10	-.08	-.07	-.08	-.10	-.12	-.14	-.17	-.18	WB/UINF
	-.00	-.00	-.07	-.04	-.08	-.09	-.06	-.05	-.01	.01	.00	CP
	.03	.03	.04	.01	.04	.06	.02	.04	-.01	-.00	-.01	CPT
.5	1.02	1.00	1.09	1.09	1.13	1.11	1.10	1.09	1.03	.99	.99	UB/UINF
	-.05	-.08	-.08	-.06	-.01	.02	.06	.10	.08	.11	.08	VB/UINF
	-.19	-.19	-.10	-.05	-.04	-.06	-.06	-.08	-.12	-.15	-.19	WB/UINF
	-.04	-.01	-.13	-.11	-.13	-.09	-.10	-.12	-.06	-.03	-.03	CP
	.03	.04	.08	.10	.15	.15	.12	.09	.03	-.00	-.00	CPT
0.0	1.01	1.03	1.14	1.14	1.17	1.20	1.17	1.15	1.09	1.01	1.02	UB/UINF
	-.06	-.08	-.09	-.05	-.01	.02	.07	.10	.12	.13	.09	VB/UINF
	-.20	-.21	-.07	-.03	-.01	.01	-.03	-.07	-.11	-.15	-.21	WB/UINF
	-.04	-.07	-.21	-.21	-.24	-.23	-.20	-.19	-.15	-.09	-.06	CP
	.03	.04	.10	.11	.15	.22	.19	.15	.08	-.02	.03	CPT
-.5	1.00	1.04	1.12	1.11	1.09	1.13	1.07	1.19	1.14	1.07	.99	UB/UINF
	-.06	-.09	-.09	-.02	-.03	.07	.09	.10	.12	.16	.10	VB/UINF
	-.24	-.23	-.08	-.05	-.03	-.04	-.04	-.09	-.11	-.18	-.23	WB/UINF
	-.02	-.06	-.24	-.25	-.25	-.22	-.22	-.24	-.19	-.14	-.03	CP
	.04	.08	.03	-.01	-.07	.07	-.07	.20	.14	.07	.02	CPT
-1.0	1.01	1.06	1.08	.89	.96	.91	.96	1.02	1.15	1.09	1.00	UB/UINF
	-.04	-.08	-.06	-.05	-.03	.03	.11	.12	.15	.11	.10	VB/UINF
	-.24	-.24	-.09	-.06	.01	.01	-.04	-.08	-.13	-.20	-.25	WB/UINF
	-.06	-.13	-.34	-.24	-.33	-.29	-.29	-.22	-.25	-.18	-.05	CP
	.03	.06	-.16	-.44	-.40	-.46	-.35	-.15	.11	.06	.03	CPT
-1.5	1.00	1.05	.93	.83	.75	.77	.89	.95	.97	1.12	1.01	UB/UINF
	-.01	-.09	-.04	-.02	.03	.05	.04	.09	.11	.12	.08	VB/UINF
	-.27	-.26	-.07	-.01	.09	.10	-.02	-.06	-.18	-.16	-.28	WB/UINF
	-.04	-.12	-.32	-.29	-.33	-.32	-.34	-.32	-.21	-.23	-.07	CP
	.02	.07	-.45	-.59	-.76	-.71	-.55	-.39	-.22	.07	.04	CPT

TABLE C3.- Continued

(b) R = 4. Continued. (This table is for upper half of cross section shown in fig. 14.)

X/D = 9.22 R = 4.01 UINF = 38.9 M/SEC
Z/D = 3.88 PHI = 15.0 DEG

ZB/D \ YB/D	-3.51	-2.51	-1.00	-.50	0.00	.50	1.00	1.51	2.01	2.51	3.51	
	.94	1.00	.96	.91	.72	.82	.84	.89	.95	1.07	.94	UB/UINF
	-.00	-.03	-.01	.03	.02	.05	.12	.15	.14	.14	.08	VB/UINF
1.5	-.35	-.35	-.15	-.05	.04	.00	-.09	-.17	-.25	-.28	-.36	WB/UINF
	.10	.01	-.26	-.35	-.19	-.30	-.25	-.19	-.07	-.10	.07	CP
	.11	.13	-.31	-.52	-.68	-.62	-.53	-.35	-.07	.15	.09	CPT
	.96	1.04	.98	.83	.77	.79	.75	.83	1.02	1.06	.99	UB/UINF
	.01	-.03	.00	.02	.05	.04	.08	.06	.10	.08	.06	VB/UINF
1.0	-.36	-.36	-.08	.01	.11	.09	.03	-.17	-.24	-.29	-.36	WB/UINF
	.04	-.06	-.34	-.29	-.31	-.31	-.27	-.25	-.23	-.17	-.04	CP
	.09	.15	-.37	-.60	-.70	-.68	-.70	-.53	-.11	.04	.09	CPT
	.97	1.02	.93	.81	.66	.74	.78	.91	1.03	1.03	.99	UB/UINF
	.04	.02	.08	.04	.03	-.01	-.07	.02	-.02	.04	.03	VB/UINF
.5	-.36	-.34	-.06	.07	.15	.17	.03	-.08	-.22	-.33	-.38	WB/UINF
	.03	-.07	-.34	-.29	-.23	-.28	-.30	-.33	-.19	-.13	-.01	CP
	.09	.09	-.46	-.62	-.77	-.70	-.69	-.48	-.07	.04	.12	CPT
	.98	1.00	.98	.82	.76	.91	.84	.99	1.00	.93	.96	UB/UINF
	.07	.06	.11	.09	.02	-.03	-.08	-.06	-.07	-.06	-.01	VB/UINF
0.0	-.34	-.31	-.07	.02	.08	.09	-.01	-.08	-.19	-.33	-.37	WB/UINF
	.01	-.07	-.29	-.28	-.29	-.43	-.29	-.28	-.23	-.10	.01	CP
	.09	.03	-.31	-.60	-.71	-.59	-.57	-.28	-.19	-.12	.06	CPT
	.98	.94	.97	.81	.84	.74	.92	.94	.96	.99	.97	UB/UINF
	.08	.15	.13	.11	.06	-.05	-.11	-.08	-.11	-.12	-.07	VB/UINF
-.5	-.32	-.32	-.06	-.01	.01	-.04	-.03	-.09	-.17	-.32	-.36	WB/UINF
	.02	.02	-.21	-.25	-.31	-.26	-.27	-.22	-.13	-.08	.02	CP
	.09	.03	-.24	-.58	-.60	-.72	-.41	-.31	-.17	.02	.11	CPT
	.97	.97	.98	.88	.78	.80	.87	.93	.98	.99	.97	UB/UINF
	.11	.17	.14	.11	.06	-.07	-.08	-.13	-.15	-.12	-.09	VB/UINF
-1.0	-.31	-.30	-.11	-.11	-.05	-.06	-.05	-.17	-.24	-.29	-.34	WB/UINF
	.03	.01	-.19	-.27	-.29	-.24	-.17	-.09	-.07	-.04	.02	CP
	.09	.07	-.20	-.46	-.68	-.58	-.40	-.17	-.02	.03	.09	CPT
	.96	.98	.96	.82	.77	.89	.89	.93	.97	.97	.95	UB/UINF
	.08	.14	.13	.05	.06	-.07	-.08	-.08	-.13	-.11	-.07	VB/UINF
-1.5	-.30	-.28	-.14	-.17	-.10	-.10	-.12	-.20	-.23	-.28	-.31	WB/UINF
	.03	.02	-.15	-.26	-.30	-.28	-.17	-.12	-.03	.00	.05	CP
	.07	.09	-.19	-.55	-.70	-.48	-.35	-.21	-.02	.03	.07	CPT

TABLE C3.- Continued

(b) R = 4. Continued. (This table is for lower half of cross section shown in fig. 14.)

X/D = 14.00   R = 4.14   UINF = 39.4 M/SEC
Z/D = 6.00   PHI = 10.5 DEG

ZB/D \ YB/D	-.51	0.00	.49	1.00	1.50	
1.5	1.02	1.02	1.05	1.04	1.13	UB/UINF
	-.03	.03	.05	.03	.08	VB/UINF
	-.13	-.12	-.12	-.15	-.16	WB/UINF
	-.10	-.14	-.13	-.11	-.17	CP
	-.04	-.07	-.01	.00	.14	CPT
1.0	.97	.98	.96	1.01	1.03	UB/UINF
	.01	.01	.02	.05	.05	VB/UINF
	-.06	-.10	-.07	-.12	-.10	WB/UINF
	-.15	-.17	-.16	-.11	-.12	CP
	-.21	-.21	-.22	-.06	-.04	CPT
.5	1.00	.94	.93	.88	1.03	UB/UINF
	-.03	.00	.04	.06	.08	VB/UINF
	-.05	-.08	-.02	-.09	-.12	WB/UINF
	-.26	-.20	-.17	-.13	-.17	CP
	-.25	-.32	-.29	-.34	-.08	CPT
0.0	.88	.87	.85	.94	1.03	UB/UINF
	.01	-.00	-.01	.03	.05	VB/UINF
	-.05	.02	.04	-.09	-.11	WB/UINF
	-.19	-.25	-.20	-.22	-.20	CP
	-.40	-.48	-.48	-.32	-.12	CPT
-.5	.82	.80	.86	.93	.95	UB/UINF
	-.03	.02	-.01	-.00	.04	VB/UINF
	.00	.02	.01	-.04	-.06	WB/UINF
	-.20	-.19	-.17	-.19	-.16	CP
	-.52	-.55	-.42	-.31	-.26	CPT
-1.0	.88	.83	.87	.82	.89	UB/UINF
	.06	.02	-.01	-.07	-.05	VB/UINF
	-.03	.07	-.01	-.03	-.11	WB/UINF
	-.23	-.24	-.19	-.15	-.16	CP
	-.45	-.54	-.43	-.48	-.34	CPT
-1.5	.84	.85	.87	.88	.99	UB/UINF
	.06	.01	.02	-.02	-.00	VB/UINF
	.06	.03	-.02	-.06	-.08	WB/UINF
	-.18	-.16	-.23	-.20	-.15	CP
	-.47	-.44	-.47	-.41	-.16	CPT

X/D = 14.00   R = 4.15   UINF = 39.4 M/SEC
Z/D = 8.25   PHI = 10.5 DEG

ZB/D \ YB/D	-.48	0.00	.50	1.02	1.52	
1.5	1.00	1.01	1.00	1.01	1.00	UB/UINF
	-.01	.01	.02	.05	.05	VB/UINF
	-.17	-.17	-.15	-.15	-.16	WB/UINF
	.06	.04	.04	.02	.04	CP
	.09	.09	.07	.07	.07	CPT
1.0	1.02	1.04	1.02	1.02	1.02	UB/UINF
	.00	.02	.04	.03	.05	VB/UINF
	-.14	-.13	-.14	-.14	-.15	WB/UINF
	.01	-.00	.01	.00	.03	CP
	.08	.10	.08	.06	.09	CPT
.5	1.09	1.05	1.08	1.08	1.03	UB/UINF
	-.01	.02	.03	.05	.07	VB/UINF
	-.12	-.13	-.12	-.14	-.15	WB/UINF
	-.02	-.03	-.05	-.01	.03	CP
	.19	.11	.14	.18	.13	CPT
0.0	1.07	1.06	1.09	1.08	1.06	UB/UINF
	-.01	.01	.03	.04	.07	VB/UINF
	-.11	-.10	-.12	-.12	-.14	WB/UINF
	-.05	-.04	-.07	-.06	-.02	CP
	.11	.10	.14	.13	.13	CPT
-.5	1.04	1.04	1.06	1.04	1.03	UB/UINF
	.01	.01	.05	.07	.09	VB/UINF
	-.12	-.10	-.12	-.12	-.13	WB/UINF
	-.08	-.07	-.06	-.07	-.03	CP
	.02	.02	.07	.04	.05	CPT
-1.0	.95	1.02	.94	1.05	1.04	UB/UINF
	-.02	.01	.03	.05	.06	VB/UINF
	-.10	-.13	-.13	-.13	-.13	WB/UINF
	-.06	-.12	-.04	-.13	-.09	CP
	-.15	-.06	-.14	-.01	.01	CPT
-1.5	.92	.92	.93	.98	1.04	UB/UINF
	.01	-.00	.04	.06	.05	VB/UINF
	-.09	-.08	-.10	-.11	-.13	WB/UINF
	-.12	-.12	-.11	-.13	-.11	CP
	-.25	-.26	-.22	-.15	-.01	CPT

TABLE C3.- Continued

(b) R = 4. Continued.

X/D = 15.78 R = 4.00 UINF = 38.6
Z/D = 8.60 PHI = 10.0

ZB/D \ YB/D	-.98	-.49	0.00	.49	.99	
1.5	.95	.97	.96	.98	.96	UB/UINF
	-.01	.02	.01	.02	.04	VB/UINF
	-.17	-.16	-.15	-.16	-.17	WB/UINF
	.10	.06	.08	.05	.08	CP
	.03	.03	.02	.03	.04	CPT
1.0	.99	1.00	.99	.99	1.00	UB/UINF
	-.02	-.02	-.00	.01	.02	VB/UINF
	-.14	-.14	-.12	-.13	-.12	WB/UINF
	.02	.01	.01	.00	-.01	CP
	.02	.03	.01	.01	.02	CPT
.5	1.00	1.04	1.04	1.05	1.03	UB/UINF
	-.02	-.02	-.01	.01	.02	VB/UINF
	-.16	-.13	-.11	-.12	-.13	WB/UINF
	-.00	-.03	-.05	-.03	-.01	CP
	.03	.06	.05	.08	.07	CPT
0.0	1.02	1.04	1.04	1.03	1.05	UB/UINF
	-.05	-.03	-.01	.00	.00	VB/UINF
	-.12	-.11	-.12	-.13	-.13	WB/UINF
	-.03	-.05	-.03	-.05	-.04	CP
	.03	.05	.07	.04	.08	CPT
-.5	1.02	1.05	1.05	1.05	1.07	UB/UINF
	-.04	-.02	.01	.00	.01	VB/UINF
	-.12	-.11	-.12	-.09	-.10	WB/UINF
	-.05	-.07	-.07	-.07	-.07	CP
	.01	.05	.04	.06	.09	CPT
-1.0	1.05	1.02	1.02	.99	.98	UB/UINF
	-.01	-.02	.00	.04	-.00	VB/UINF
	-.11	-.11	-.13	-.12	-.12	WB/UINF
	-.09	-.10	-.12	-.07	-.06	CP
	.02	-.05	-.06	-.07	-.08	CPT
-1.5	1.01	1.02	1.00	.98	.92	UB/UINF
	-.03	-.01	-.00	.02	.05	VB/UINF
	-.13	-.09	-.10	-.09	-.13	WB/UINF
	-.13	-.14	-.15	-.12	-.07	CP
	-.08	-.09	-.13	-.15	-.20	CPT

X/D = 35.00 R = 4.14 UINF = 39.1 M/SEC
Z/D = 8.50 PHI = 6.3 DEG

ZB/D \ YB/D	-.51	-.01	.48	.97	1.46	1.96	
1.5	1.01	1.01	1.00	1.01	.99	1.02	UB/UINF
	-.00	.00	-.00	-.01	.03	.02	VB/UINF
	-.08	-.08	-.07	-.07	-.09	-.10	WB/UINF
	-.10	-.10	-.10	-.07	-.07	-.09	CP
	-.07	-.07	-.10	-.05	-.07	-.04	CPT
1.0	.95	.96	.99	.97	.98	.93	UB/UINF
	-.00	-.00	.00	.01	.02	.03	VB/UINF
	-.00	-.04	-.04	-.03	-.02	-.00	WB/UINF
	-.02	-.00	-.07	.03	-.01	.04	CP
	-.11	-.08	-.09	-.04	-.05	-.09	CPT
.5	.97	.99	.98	.98	1.00	1.01	UB/UINF
	.01	.01	.00	.01	.02	.02	VB/UINF
	-.07	-.08	-.10	-.08	-.07	-.09	WB/UINF
	-.09	-.09	-.10	-.03	-.10	-.10	CP
	-.14	-.11	-.12	-.07	-.10	-.06	CPT
0.0	.97	.98	.98	.98	.98	.97	UB/UINF
	-.00	.01	.02	.03	.00	.01	VB/UINF
	-.05	-.06	-.07	-.09	-.08	-.08	WB/UINF
	-.12	-.11	-.09	-.04	-.10	-.07	CP
	-.18	-.13	-.12	-.07	-.12	-.12	CPT
-.5	.94	.94	.94	.96	1.00	1.00	UB/UINF
	.01	.00	.01	.01	.03	.01	VB/UINF
	-.07	-.08	-.09	-.06	-.09	-.09	WB/UINF
	-.10	-.09	-.12	-.06	-.11	-.09	CP
	-.21	-.20	-.23	-.12	-.10	-.08	CPT
-1.0	.92	.95	.97	.96	.97	.98	UB/UINF
	.00	.01	.00	-.01	.01	-.00	VB/UINF
	-.04	-.06	-.09	-.07	-.09	-.09	WB/UINF
	-.08	-.11	-.13	-.04	-.12	-.11	CP
	-.22	-.20	-.18	-.12	-.16	-.13	CPT
-1.5	.92	.95	.93	.95	.97	1.02	UB/UINF
	.01	.01	-.01	.01	.02	.01	VB/UINF
	-.07	-.06	-.07	-.07	-.08	-.07	WB/UINF
	-.10	-.09	-.12	-.07	-.12	-.09	CP
	-.24	-.19	-.26	-.16	-.17	-.04	CPT

TABLE C3.- Continued

(b) R = 4. Continued.

X/D = 45.00 R = 4.16 UINF = 39.5 M/SEC PINF = .102E+06 N/M**2
Z/D = 9.75 PHI = 5.8 DEG Q = .965E+03 N/M**2

ZB/D \ YB/D	-1.01	-.51	0.00	.51	1.01	
1.5	1.00	1.01	1.02	1.00	.98	UB/UINF
	-.01	-.01	.01	-.01	.01	VB/UINF
	-.08	-.09	-.09	-.09	-.09	WB/UINF
	-.06	-.06	-.08	-.07	-.05	CP
	-.04	-.02	-.03	-.05	-.07	CPT
1.0	.94	.97	.93	.97	1.00	UB/UINF
	-.03	-.00	-.01	-.01	.01	VB/UINF
	-.01	-.01	-.05	-.04	-.03	WB/UINF
	.01	.01	.01	-.01	-.05	CP
	-.09	-.04	-.12	-.06	-.04	CPT
.5	.95	1.01	.99	.99	.99	UB/UINF
	-.03	-.00	-.01	-.00	.01	VB/UINF
	-.05	-.06	-.03	-.05	-.06	WB/UINF
	-.02	-.06	-.04	-.05	-.05	CP
	-.11	-.04	-.06	-.06	-.06	CPT
0.0	.92	.95	1.00	.99	.94	UB/UINF
	-.03	-.02	-.00	.00	.00	VB/UINF
	-.07	-.07	-.08	-.07	-.08	WB/UINF
	-.03	-.04	-.08	-.09	-.06	CP
	-.18	-.13	-.06	-.09	-.18	CPT
-.5	.97	.99	.96	.98	.99	UB/UINF
	-.01	-.00	.00	.02	.03	VB/UINF
	-.06	-.06	-.06	-.06	-.07	WB/UINF
	-.08	-.07	-.05	-.10	-.11	CP
	-.14	-.08	-.12	-.13	-.13	CPT
-1.0	.93	.94	.95	.92	.92	UB/UINF
	-.01	.04	-.01	.00	.00	VB/UINF
	-.08	-.09	-.07	-.04	-.05	WB/UINF
	-.08	-.07	-.05	-.08	-.04	CP
	-.20	-.17	-.15	-.24	-.19	CPT
-1.5	.97	.94	.97	.87	.97	UB/UINF
	-.02	.00	-.00	-.02	.00	VB/UINF
	-.06	-.06	-.06	-.06	-.08	WB/UINF
	-.11	-.06	-.09	-.02	-.09	CP
	-.18	-.18	-.15	-.26	-.13	CPT

TABLE C3.- Continued

(b) R = 4. Concluded.

X/D = 2.00 R = 6.03 UINF = 41.1 M/SEC
Z/D = 3.50 PHI = 38.0 DEG

ZB/D \ YB/D	0.00	.52	.79	1.05	1.30	1.56	2.09	
1.5	3.14	3.14	3.07	2.54	1.61	.97	.66	UB/UINF
	.07	.46	.56	.73	.80	.75	.42	VB/UINF
	.92	.93	.78	.44	.10	-.44	-.77	WB/UINF
	-4.58	-4.25	-4.31	-3.39	-2.16	-1.24	-.46	CP
	5.60	6.19	5.49	2.99	.12	-.51	-.25	CPT
1.0	1.05	1.66	2.39	2.82	2.58	1.84	.87	UB/UINF
	-.02	.45	.57	.75	.83	.83	.48	VB/UINF
	.54	.38	.32	.42	.20	-.27	-.90	WB/UINF
	-2.72	-3.67	-4.11	-4.23	-3.30	-2.95	-1.03	CP
	-2.30	-1.52	1.19	3.77	3.33	.24	-.21	CPT
.5	.51	1.02	1.40	1.89	2.57	2.27	1.07	UB/UINF
	-.12	.45	.60	.58	.66	.74	.31	VB/UINF
	1.20	.88	.22	-.07	-.09	-.43	-1.07	WB/UINF
	-2.16	-3.43	-3.92	-3.62	-4.34	-3.68	-1.74	CP
	-1.43	-2.40	-2.53	-.64	1.93	1.33	-.34	CPT
0.0	.55	1.38	1.45	2.18	2.38	2.22	1.11	UB/UINF
	-.01	-.39	-.22	-.09	.24	.26	.02	VB/UINF
	1.35	1.03	.55	-.21	-.41	-.64	-1.13	WB/UINF
	-2.99	-4.42	-4.45	-4.71	-4.36	-4.04	-2.07	CP
	-1.85	-2.28	-2.97	-.79	.66	.49	-.54	CPT
-.5	.61	1.24	1.71	1.86	1.86	1.56	1.00	UB/UINF
	-.00	-.90	-.84	-.69	-.48	-.32	-.44	VB/UINF
	1.15	.85	.40	-.18	-.56	-.90	-1.05	WB/UINF
	-1.92	-2.29	-3.42	-3.64	-3.29	-2.94	-1.51	CP
	-1.21	-.19	-.56	-.59	-.21	-.56	-.18	CPT
-1.0	.67	.95	1.03	1.20	1.20	1.21	.95	UB/UINF
	.17	-.50	-.75	-.83	-.76	-.72	-.57	VB/UINF
	.70	.45	.29	-.09	-.43	-.60	-.82	WB/UINF
	-.88	-.97	-.97	-1.23	-1.41	-1.48	-.87	CP
	-.91	-.60	-.25	-.09	-.19	-.14	.04	CPT
-1.5	.68	.76	.92	.96	.89	.99	.88	UB/UINF
	.07	-.37	-.38	-.47	-.59	-.55	-.44	VB/UINF
	.20	.09	-.03	-.17	-.37	-.51	-.72	WB/UINF
	-.67	-.33	-.33	-.42	-.28	-.47	-.42	CP
	-1.16	-.61	-.33	-.25	.02	.07	.08	CPT

X/D = 6.00 R = 6.05 UINF = 41.1 M/SEC
Z/D = 6.00 PHI = 24.0 DEG

ZB/D \ YB/D	0.00	.48	.95	1.43	1.91	2.39	
1.5	.82	1.16	1.18	1.35	1.33	1.38	UB/UINF
	.00	.15	.31	.36	.44	.39	VB/UINF
	.32	.16	.07	-.15	-.29	-.38	WB/UINF
	-.52	-.95	-.83	-.90	-.68	-.93	CP
	-.74	-.56	-.32	.10	.39	.29	CPT
1.0	.91	.99	1.03	1.35	1.38	1.35	UB/UINF
	.04	.16	.23	.26	.34	.39	VB/UINF
	.50	.35	.17	-.12	-.34	-.41	WB/UINF
	-.81	-.87	-.96	-1.08	-.81	-.69	CP
	-.73	-.73	-.81	-.15	.36	.47	CPT
.5	.81	.93	1.20	1.21	1.44	1.35	UB/UINF
	-.03	.01	.16	.29	.27	.31	VB/UINF
	.67	.57	.22	-.11	-.31	-.51	WB/UINF
	-.78	-.87	-1.19	-1.10	-1.18	-.86	CP
	-.67	-.67	-.67	-.53	.08	.34	CPT
0.0	.91	.98	1.20	1.55	1.30	1.28	UB/UINF
	-.05	-.07	.03	.07	.15	.13	VB/UINF
	.73	.60	.34	-.05	-.39	-.61	WB/UINF
	-.85	-.88	-1.07	-1.45	-.87	-.87	CP
	-.49	-.55	-.51	-.02	-.01	.18	CPT
-.5	.79	1.06	1.27	1.36	1.45	1.21	UB/UINF
	-.06	-.06	-.11	-.02	.01	.01	VB/UINF
	.67	.56	.24	-.12	-.40	-.62	WB/UINF
	-.70	-.93	-.90	-1.00	-1.12	-.86	CP
	-.62	-.49	-.21	-.13	.17	.00	CPT
-1.0	.91	1.04	1.15	1.35	1.23	1.21	UB/UINF
	.01	-.16	-.30	-.25	-.25	-.18	VB/UINF
	.50	.46	.24	-.15	-.42	-.57	WB/UINF
	-.67	-.59	-.68	-1.02	-.75	-.81	CP
	-.58	-.25	-.20	-.10	.03	.01	CPT
-1.5	.86	1.00	1.06	1.03	1.07	1.01	UB/UINF
	.02	-.14	-.34	-.46	-.40	-.33	VB/UINF
	.36	.32	.13	-.14	-.38	-.57	WB/UINF
	-.48	-.47	-.42	-.31	-.44	-.39	CP
	-.61	-.34	-.15	.00	.03	.06	CPT

TABLE C3.- Continued

(c) R = 6.

X/D = 14.00   R = 6.03   UINF = 42.6 M/SEC
Z/D = 8.50   PHI = 15.0 DEG

ZB/D \ YB/D	-.50	-.01	.49	.99	1.49	1.98	
	.89	1.03	.99	1.07	1.11	1.08	UB/UINF
	-.10	-.02	.04	.12	.19	.22	VB/UINF
1.5	.10	.14	.13	.09	-.04	-.07	WB/UINF
	-.19	-.39	-.34	-.44	-.45	-.38	CP
	-.39	-.31	-.35	-.27	-.18	-.16	CPT
	.94	.94	1.02	.96	1.04	1.04	UB/UINF
	-.09	-.02	.05	.16	.17	.21	VB/UINF
1.0	.17	.27	.14	.12	.11	-.05	WB/UINF
	-.32	-.33	-.43	-.40	-.40	-.35	CP
	-.39	-.37	-.35	-.43	-.27	-.22	CPT
	.93	.97	.90	.97	1.01	.99	UB/UINF
	-.06	-.03	-.01	.07	.16	.16	VB/UINF
.5	.30	.29	.33	.19	.08	-.06	WB/UINF
	-.41	-.38	-.27	-.41	-.39	-.39	CP
	-.45	-.36	-.35	-.43	-.32	-.38	CPT
	1.01	1.00	.97	1.11	.95	1.13	UB/UINF
	-.03	-.02	-.04	.05	.06	.09	VB/UINF
0.0	.22	.32	.31	.23	.15	.05	WB/UINF
	-.50	-.40	-.40	-.49	-.34	-.47	CP
	-.44	-.30	-.35	-.20	-.40	-.18	CPT
	.93	.94	1.01	1.08	1.11	1.09	UB/UINF
	.07	.02	-.03	-.01	.02	.04	VB/UINF
-.5	.40	.28	.37	.23	.11	-.01	WB/UINF
	-.24	-.38	-.38	-.43	-.51	-.47	CP
	-.21	-.42	-.22	-.20	-.26	-.27	CPT
	1.03	.96	.99	1.03	1.14	1.02	UB/UINF
	.07	.03	-.00	-.10	-.03	-.07	VB/UINF
-1.0	.24	.30	.31	.24	.13	-.08	WB/UINF
	-.37	-.38	-.44	-.31	-.41	-.26	CP
	-.23	-.36	-.35	-.18	-.08	-.21	CPT
	.98	.95	.95	.96	1.09	1.12	UB/UINF
	.08	.03	-.04	-.08	-.08	-.09	VB/UINF
-1.5	.31	.28	.28	.26	.14	-.04	WB/UINF
	-.25	-.33	-.32	-.16	-.32	-.33	CP
	-.19	-.35	-.33	-.16	-.10	-.06	CPT

X/D = 14.02   R = 6.04   UINF = 42.5 M/SEC
Z/D = 11.50   PHI = 15.0 DEG

ZB/D \ YB/D	-.49	.01	.52	1.03	1.55	2.01	
	1.02	1.07	1.03	.99	.98	1.02	UB/UINF
	-.04	-.01	.03	.07	.12	.13	VB/UINF
1.5	-.15	-.15	-.14	-.16	-.19	-.18	WB/UINF
	-.02	-.06	-.02	-.01	-.02	-.05	CP
	.06	.10	.06	.00	.01	.04	CPT
	1.08	1.06	1.13	1.06	1.05	1.01	UB/UINF
	-.05	.01	.03	.10	.11	.13	VB/UINF
1.0	-.10	-.06	-.09	-.08	-.13	-.15	WB/UINF
	-.05	-.06	-.12	-.08	-.07	-.05	CP
	.12	.07	.16	.07	.07	.01	CPT
	1.08	1.07	1.15	1.05	1.12	1.04	UB/UINF
	-.06	-.02	.06	.07	.13	.16	VB/UINF
.5	-.08	-.07	-.08	-.07	-.07	-.12	WB/UINF
	-.12	-.15	-.17	-.09	-.10	-.09	CP
	.06	.02	.16	.03	.17	.04	CPT
	1.07	1.06	1.06	1.01	1.08	1.03	UB/UINF
	-.06	-.03	.06	.08	.12	.19	VB/UINF
0.0	-.06	-.06	-.06	-.07	-.07	-.11	WB/UINF
	-.15	-.15	-.13	-.09	-.19	-.12	CP
	.02	-.03	-.00	-.06	.01	-.02	CPT
	.99	1.02	.97	1.02	1.05	.99	UB/UINF
	-.08	-.03	.02	.10	.15	.19	VB/UINF
-.5	-.03	-.01	-.01	-.02	-.06	-.08	WB/UINF
	-.20	-.20	-.20	-.19	-.17	-.15	CP
	-.20	-.16	-.25	-.13	-.05	-.12	CPT
	.96	1.05	.97	.95	1.02	1.07	UB/UINF
	-.12	.00	.03	.12	.13	.22	VB/UINF
-1.0	-.01	.04	.08	.06	-.06	-.11	WB/UINF
	-.23	-.26	-.28	-.23	-.21	-.26	CP
	-.29	-.16	-.33	-.30	-.16	-.06	CPT
	.92	.85	.97	1.07	.99	1.03	UB/UINF
	-.08	-.06	.06	.11	.18	.22	VB/UINF
-1.5	.10	.13	.18	.06	.01	-.10	WB/UINF
	-.28	-.19	-.26	-.37	-.30	-.24	CP
	-.41	-.44	-.29	-.21	-.29	-.11	CPT

TABLE C3.- Continued

(c) R = 6. Continued.

X/D = 35.00 R = 6.01 UINF = 41.4 M/SEC
Z/D = 13.00 PHI = 9.5 DEG

ZB/D \ YB/D	-.50	0.00	.50	1.00	1.49	1.99	2.49	
1.5	.97	.98	1.02	.98	.98	1.03	.99	UB/UINF
	-.03	-.00	.01	.01	.06	.07	.09	VB/UINF
	-.06	-.08	-.09	-.08	-.08	-.09	-.13	WB/UINF
	-.01	-.05	-.08	-.04	-.03	-.11	-.05	CP
	-.07	-.08	-.03	-.06	-.06	-.03	-.03	CPT
1.0	1.03	1.00	.99	1.02	1.04	.98	1.00	UB/UINF
	-.05	-.00	-.01	.03	.04	.06	.10	VB/UINF
	-.03	-.03	-.03	-.03	-.04	-.08	-.08	WB/UINF
	-.07	-.06	-.08	-.11	-.10	-.05	-.06	CP
	-.01	-.06	-.10	-.06	-.02	-.07	-.04	CPT
.5	1.00	1.01	.98	1.03	1.04	.97	1.01	UB/UINF
	-.03	-.02	.02	.04	.05	.06	.12	VB/UINF
	-.04	-.03	.01	.02	-.03	-.06	-.04	WB/UINF
	-.04	-.09	-.09	-.14	-.13	-.04	-.08	CP
	-.03	-.07	-.12	-.07	-.04	-.09	-.03	CPT
0.0	.95	1.00	1.00	1.00	.95	1.00	1.00	UB/UINF
	-.05	-.02	.01	.02	.06	.07	.09	VB/UINF
	.00	.02	-.01	.03	-.06	.00	-.07	WB/UINF
	-.04	-.09	-.09	-.12	-.02	-.11	-.05	CP
	-.13	-.08	-.09	-.10	-.10	-.09	-.02	CPT
-.5	.99	.96	1.03	1.00	.96	1.00	1.08	UB/UINF
	-.01	.00	-.01	.02	.05	.05	.06	VB/UINF
	.03	.03	.03	.07	.03	.01	-.03	WB/UINF
	-.13	-.09	-.13	-.12	-.05	-.09	-.13	CP
	-.14	-.15	-.07	-.12	-.12	-.08	.06	CPT
-1.0	.92	.99	.98	.98	1.06	1.06	.99	UB/UINF
	-.05	-.02	.00	.04	.01	.08	.06	VB/UINF
	.06	.03	.06	.08	.04	.05	-.06	WB/UINF
	-.04	-.11	-.12	-.09	-.26	-.19	-.04	CP
	-.18	-.11	-.15	-.11	-.13	-.06	-.06	CPT
-1.5	.96	1.01	.97	1.04	.98	1.03	1.03	UB/UINF
	-.05	.00	.02	-.02	.01	.03	.04	VB/UINF
	.01	.07	.13	.04	.00	.03	.03	WB/UINF
	-.07	-.12	-.11	-.15	-.08	-.09	-.10	CP
	-.14	-.10	-.15	-.07	-.11	-.04	-.04	CPT

X/D = 35.00 R = 6.05 UINF = 41.8 M/SEC
Z/D = 13.00 PHI = 9.3 DEG

ZB/D \ YB/D	-.50	0.00	.49	.96	1.46	1.96	2.45	
1.5	.99	1.01	1.01	1.03	1.01	1.07	1.04	UB/UINF
	-.05	-.02	.01	.05	.07	.08	.09	VB/UINF
	-.04	-.02	-.04	-.06	-.03	-.06	-.08	WB/UINF
	-.15	-.16	-.10	-.17	-.16	-.21	-.19	CP
	-.17	-.14	-.08	[illegible]	-.13	-.05	-.09	CPT
1.0	.96	1.00	.91	.95	1.00	1.02	.97	UB/UINF
	-.03	-.03	.01	.00	.07	.06	.09	VB/UINF
	.02	.01	.02	.02	.00	.02	-.02	WB/UINF
	-.18	-.15	-.04	-.07	-.13	-.15	-.07	CP
	-.26	-.14	-.21	-.17	-.13	-.11	-.11	CPT
.5	.94	1.01	1.02	1.02	.93	1.04	1.02	UB/UINF
	-.04	-.01	.03	.03	.08	.07	.09	VB/UINF
	-.00	.01	-.02	.01	.06	-.03	-.04	WB/UINF
	-.10	-.20	-.18	-.17	-.12	-.16	-.20	CP
	-.21	-.18	-.13	-.12	-.25	-.08	-.15	CPT
0.0	1.02	.98	.95	1.00	1.02	1.00	1.01	UB/UINF
	-.02	-.02	.01	.03	.06	.04	.08	VB/UINF
	.02	.06	-.01	.05	.03	.03	.00	WB/UINF
	-.25	-.18	-.14	-.14	-.17	-.12	-.18	CP
	-.21	-.21	-.22	-.12	-.13	-.13	-.14	CPT
-.5	.97	.99	1.02	.94	1.00	.99	.97	UB/UINF
	-.04	-.00	.00	.02	.06	.07	.09	VB/UINF
	.09	.05	.07	.06	.07	.01	-.01	WB/UINF
	-.19	-.18	-.14	-.09	-.12	-.19	-.16	CP
	-.24	-.20	-.09	-.19	-.10	-.19	-.20	CPT
-1.0	.97	.99	.99	1.06	1.05	1.02	1.07	UB/UINF
	-.00	-.02	.01	.03	.04	.03	.07	VB/UINF
	.06	.06	.10	.06	.06	.01	.00	WB/UINF
	-.18	-.20	-.17	-.22	-.22	-.14	-.23	CP
	-.22	-.20	-.17	-.09	-.11	-.09	-.08	CPT
-1.5	.98	.99	.98	.93	1.00	.99	1.02	UB/UINF
	-.02	.01	-.01	.00	.04	.03	.03	VB/UINF
	.10	.05	.14	.03	.03	.01	-.04	WB/UINF
	-.15	-.17	-.16	-.10	-.16	-.16	-.19	CP
	-.17	-.19	-.19	-.23	-.16	-.18	-.15	CPT

TABLE C3.- Continued

(c) R = 6. Continued. (These two tables are for same cross section. They could serve as means for determining actual variations in measured quantities.)

X/D = 45.00 R = 6.05 UINF = 42.2 M/SEC PINF = .102E+06 N/M**2
Z/D = 14.75 PHI = 8.1 DEG Q = .110E+04 N/M**2

ZB/D \ YB/D	-1.00	-.50	-.00	.50	1.00	
1.5	1.01	.96	1.00	1.01	1.02	UB/UINF
	-.03	-.06	-.01	.00	.01	VB/UINF
	-.07	-.05	-.06	-.05	-.06	WB/UINF
	-.15	-.07	-.11	-.12	-.12	CP
	-.12	-.15	-.10	-.09	-.07	CPT
1.0	.95	.91	.96	.94	.97	UB/UINF
	-.07	-.04	-.01	.02	-.01	VB/UINF
	-.01	.01	.01	.01	.01	WB/UINF
	-.06	-.04	-.06	-.04	-.01	CP
	-.15	-.20	-.13	-.15	-.05	CPT
.5	.99	.98	.98	1.00	.99	UB/UINF
	-.04	-.02	-.02	.01	.02	VB/UINF
	-.04	-.02	.00	-.04	-.00	WB/UINF
	-.11	-.14	-.13	-.09	-.08	CP
	-.12	-.18	-.16	-.08	-.09	CPT
0.0	.96	.97	.98	.98	1.01	UB/UINF
	-.06	-.03	-.03	-.00	.01	VB/UINF
	-.02	-.03	.00	-.02	-.01	WB/UINF
	-.13	-.14	-.12	-.11	-.15	CP
	-.19	-.20	-.15	-.15	-.13	CPT
-.5	.94	.98	.97	1.00	1.01	UB/UINF
	-.07	-.04	-.02	-.01	.02	VB/UINF
	.02	-.00	.04	-.01	.02	WB/UINF
	-.12	-.18	-.12	-.13	-.12	CP
	-.22	-.22	-.18	-.13	-.10	CPT
-1.0	.94	.98	.98	.99	.97	UB/UINF
	-.05	-.04	-.01	.01	.00	VB/UINF
	.00	-.01	.02	.05	.01	WB/UINF
	-.14	-.17	-.18	-.15	-.09	CP
	-.25	-.22	-.22	-.16	-.15	CPT
-1.5	.94	.96	.94	1.01	.98	UB/UINF
	-.04	-.04	-.02	-.00	-.01	VB/UINF
	.03	.06	.03	.04	.00	WB/UINF
	-.14	-.13	-.12	-.11	-.10	CP
	-.26	-.19	-.22	-.09	-.13	CPT

TABLE C3.- Continued

(c) R = 6. Concluded.

X/D = 2.00 R = 8.06 UINF = 38.4 M/SEC
Z/D = 5.00 PHI = 45.0 DEG

ZB/D \ YB/D	.01	.49	.75	1.00	1.25	1.49	1.75	2.00	2.50	
1.5	3.73	3.78	3.41	2.87	1.86	1.28	.80	.56	.51	UB/UINF
	.07	.54	.68	.75	.81	.89	.71	.57	.36	VB/UINF
	1.20	1.05	1.17	.72	.15	-.41	-.66	-.92	-.99	WB/UINF
	-5.13	-6.03	-4.36	-4.10	-3.12	-2.18	-1.38	-.64	-.17	CP
	10.08	9.56	8.74	4.52	.07	-.56	-.79	-.15	.21	CPT
1.0	2.14	2.29	3.08	3.37	3.02	1.89	1.44	1.00	.73	UB/UINF
	.06	.47	.65	.75	.90	1.01	.85	.51	.35	VB/UINF
	.69	.77	.68	.65	.44	-.08	-.49	-.97	-1.09	WB/UINF
	-4.50	-4.33	-5.10	-5.06	-4.34	-3.00	-2.58	-1.92	-.78	CP
	-.36	.68	4.62	6.86	5.17	.69	-.52	-.69	.08	CPT
.5	.68	1.30	1.62	2.49	3.07	2.72	2.31	1.40	.75	UB/UINF
	-.09	.37	.63	.63	.70	.88	.67	.67	.25	VB/UINF
	1.26	1.00	.53	.18	.03	-.11	-.42	-.95	-1.27	WB/UINF
	-2.49	-3.78	-4.43	-5.[illegible]5	-5.28	-4.66	-4.34	-2.77	-.98	CP
	-1.42	-1.94	-2.09	.46	3.97	2.77	.73	-.41	.29	CPT
0.0	.58$	1.36	2.19	2.49	2.82	2.86	2.21	1.41	.82	UB/UINF
	-.18	-.21	-.14	.09	.35	.47	.49	.30	.04	VB/UINF
	1.66	1.37	.71	.14	-.33	-.48	-.74	-1.12	-1.19	WB/UINF
	-2.94	-4.38	-5.80	-5.81	-5.00	-5.05	-4.14	-3.14	-1.80	CP
	-.79	-1.57	-1.40	-.45	2.42	2.84	.65	-.79	-.70	CPT
-.5	.68	1.43	2.14	2.68	2.60	2.29	1.87	1.36	.84	UB/UINF
	-.13	-.89	-.73	-.64	-.34	-.14	-.05	-.21	-.19	VB/UINF
	1.37	1.27	.83	.21	-.27	-.71	-.97	-1.25	-1.36	WB/UINF
	-2.98	-3.16	-4.55	-5.14	-4.87	-4.58	-3.83	-2.84	-1.28	CP
	-1.60	.36	.37	1.68	1.23	.30	-.32	-.35	.33	CPT
-1.0	.69	1.12	1.25	1.60	1.79	1.67	1.30	1.17	.87	UB/UINF
	.04	-.67	-.82	-.99	-.74	-.66	-.70	-.63	-.42	VB/UINF
	.99	.86	.65	.16	-.33	-.67	-.88	-.97	-1.11	WB/UINF
	-1.06	-1.20	-1.67	-2.42	-3.14	-3.03	-2.46	-2.10	-1.04	CP
	-.60	.27	.03	.19	-.25	-.32	-.47	-.38	.15	CPT
-1.5	.72	.89	1.03	1.03	1.10	1.08	1.08	.92	.94	UB/UINF
	.03	-.43	-.56	-.70	-.75	-.85	-.63	-.63	-.44	VB/UINF
	.45	.34	.22	.08	-.20	-.54	-.74	-.85	-.91	WB/UINF
	-.17	-.12	-.39	-.50	-.85	-.87	-1.01	-.66	-.75	CP
	-.45	-.02	.03	.06	-.03	.33	.13	.34	.18	CPT

TABLE C3.- Continued

(d) R = 8.

X/D = 2.03 R = 8.04 UINF = 38.5 M/SEC

Z/D = 6.75 PHI = 45.0 DEG

ZB/D \ YB/D		.01	.51	.75	1.00	1.25	1.49	1.75	2.00	2.50
1.5	UB/UINF	1.69	1.39	.95	.78	.49	.55	.44	.57	.54
	VB/UINF	.04	.43	.59	.68	.66	.55	.55	.47	.38
	WB/UINF	.45	.35	.06	-.23	-.35	-.60	-.67	-.68	-.73
	CP	-1.15	-.91	-.54	-.25	.14	.12	.46	.15	.17
	CPT	.94	.34	-.27	-.12	-.06	.08	.41	.16	.15
1.0	UB/UINF	2.86	2.44	1.95	1.78	1.22	.79	.67	.66	.61
	VB/UINF	.07	.44	.61	.76	.65	.81	.64	.57	.46
	WB/UINF	.76	.70	.63	.12	-.24	-.34	-.62	-.75	-.76
	CP	-2.36	-2.09	-1.54	-1.90	-1.11	-.64	-.44	-.17	-.06
	CPT	5.66	3.67	2.11	.90	-.12	-.25	-.20	.15	.10
.5	UB/UINF	2.63	2.61	2.60	2.63	2.08	1.79	1.37	.84	.65
	VB/UINF	-.00	.39	.64	.68	.77	.71	.74	.79	.43
	WB/UINF	.61	.68	.52	.36	.22	-.07	-.42	-.61	-.92
	CP	-2.81	-2.56	-2.69	-2.83	-2.37	-2.32	-2.00	-1.01	-.46
	CPT	3.64	4.04	5.11	3.86	1.70	.43	-.36	-.30	.01
0.0	UB/UINF	1.29	1.72	2.19	2.43	2.55	2.13	1.67	1.55	.73
	VB/UINF	-.10	.45	.60	.73	.82	.93	.88	.71	.61
	WB/UINF	.65	.45	.33	.29	.10	-.03	-.32	-.59	-.96
	CP	-1.98	-2.58	-3.05	-3.15	-3.19	-2.64	-2.32	-2.60	-.81
	CPT	-.86	-.20	1.31	2.53	3.16	1.84	.36	-.30	.04
-.5	UB/UINF	.99	1.29	1.49	2.11	2.42	2.34	2.16	1.72	1.08
	VB/UINF	-.21	.40	.54	.65	.74	.71	.77	.71	.52
	WB/UINF	1.09	1.00	.41	.07	-.21	-.26	-.43	-.68	-.88
	CP	-2.06	-2.34	-2.97	-3.56	-3.24	-3.15	-2.98	-2.58	-2.01
	CPT	-.84	-.48	-1.27	.39	2.36	2.04	1.55	.39	-.76
-1.0	UB/UINF	.96	1.38	1.82	2.12	2.26	2.33	2.20	1.84	.97
	VB/UINF	-.08	-.21	.07	.26	.34	.58	.54	.40	.33
	WB/UINF	1.38	1.17	.55	-.01	-.33	-.53	-.66	-.85	-1.13
	CP	-2.28	-2.74	-3.39	-3.75	-3.86	-3.22	-3.31	-3.21	-2.01
	CPT	-.42	-.39	-.72	-.11	.56	1.93	1.35	.13	-.67
-1.5	UB/UINF	.99	1.37	1.94	2.26	2.48	2.35	1.98	1.83	1.02
	VB/UINF	.03	-.43	-.31	-.12	.01	.17	.13	.04	-.05
	WB/UINF	1.29	1.09	.69	.16	-.24	-.60	-.83	-.92	-1.27
	CP	-2.16	-2.74	-3.16	-3.58	-3.77	-3.52	-3.14	-3.40	-1.73
	CPT	-.49	-.43	.23	.66	1.55	1.50	.54	-.15	-.06

TABLE C3.- Conti ued

(d) R = 8. Continued.

X/D = 3.69　　R = 8.03　　UINF = 38.8 M/SEC
Z/D = 9.41　　　　　　　　　PHI = 41.9 DEG

ZB/D \ YB/D		-5.15	-2.64	-1.10	-.59	-.09	.42	.93	1.44	1.95	2.45	2.96	3.47	5.00
1.5	UB/UINF	.66	.65	.82	.78	1.05	.93	.89	.64	.75	.57	.61	.63	.66
	VB/UINF	-.07	-.24	-.34	-.26	-.00	.13	.26	.31	.33	.37	.30	.27	.17
	WB/UINF	-.71	-.61	-.31	-.18	-.10	-.15	-.16	-.36	-.39	-.52	-.56	-.62	-.66
	CP	.11	.22	.06	.08	-.14	-.01	.01	.05	.06	.30	.25	.23	.11
	CPT	.06	.08	-.06	-.22	-.02	-.11	-.10	-.01	-.12	.03	.05	.08	.04
1.0	UB/UINF	.71	.57	1.25	1.52	1.63	1.40	1.23	1.18	.77	.78	.64	.69	.71
	VB/UINF	-.09	-.41	-.39	-.18	-.06	.22	.41	.41	.42	.38	.32	.28	.13
	WB/UINF	-.70	-.69	-.16	-.01	.08	.10	.01	-.13	-.40	-.54	-.69	-.67	-.70
	CP	-.03	.26	-.48	-.60	-.61	-.60	-.50	-.56	-.14	-.06	.12	.08	.01
	CPT	-.03	.24	.27	.76	1.08	.44	.20	.03	-.21	-.02	.11	.09	.02
.5	UB/UINF	.75	.66	1.52	1.91	1.95	1.95	1.94	1.48	1.27	.86	.67	.71	.66
	VB/UINF	-.11	-.40	-.45	-.16	-.05	.24	.39	.55	.50	.58	.39	.31	.13
	WB/UINF	-.73	-.72	-.12	.02	.10	.07	-.01	-.11	-.35	-.47	-.66	-.66	-.75
	CP	-.11	-.07	-.67	-1.14	-1.04	-1.05	-1.03	-.87	-.71	-.33	-.08	-.15	-.01
	CPT	.01	.05	.89	1.57	1.84	1.88	1.92	.65	.27	-.02	-.04	-.10	.04
0.0	UB/UINF	.74	.83	1.82	1.84	1.78	1.71	1.88	1.73	1.50	1.14	.87	.73	.70
	VB/UINF	-.12	-.45	-.38	-.15	-.05	.26	.47	.58	.70	.64	.46	.33	.16
	WB/UINF	-.76	-.63	-.11	.02	.05	.11	-.02	-.13	-.31	-.55	-.70	-.74	-.76
	CP	-.11	-.47	-1.06	-1.30	-1.09	-1.05	-1.24	-1.18	-1.05	-.61	-.44	-.34	-.09
	CPT	.04	-.17	1.43	1.14	1.12	.97	1.55	1.20	.82	.41	.02	-.13	.00
-.5	UB/UINF	.71	1.08	1.56	1.33	1.16	1.31	1.38	1.74	1.68	1.24	.98	.73	.71
	VB/UINF	-.11	-.46	-.48	-.28	-.05	.35	.56	.57	.62	.54	.41	.38	.11
	WB/UINF	-.79	-.75	-.15	.12	.22	.22	-.07	-.28	-.40	-.68	-.78	-.81	-.79
	CP	-.15	-.89	-1.16	-1.10	-.91	-.94	-1.16	-1.37	-1.29	-1.05	-.90	-.44	-.17
	CPT	-.02	.07	.54	-.24	-.51	-.05	.07	1.08	1.11	.26	-.15	-.10	-.02
-1.0	UB/UINF	.69	1.09	1.47	1.26	1.11	1.17	1.35	1.70	1.75	1.46	.98	.75	.65
	VB/UINF	-.10	-.46	-.42	-.34	-.05	.34	.57	.54	.63	.60	.46	.17	.09
	WB/UINF	-.81	-.86	-.08	.26	.54	.46	-.05	-.34	-.61	-.74	-.91	-.94	-.86
	CP	-.19	-1.02	-1.47	-1.24	-1.38	-1.17	-1.52	-1.79	-1.66	-1.37	-.82	-.71	-.11
	CPT	-.03	.12	-.11	-.45	-.55	-.45	-.36	.55	1.23	.68	.19	-.22	.07
-1.5	UB/UINF	.69	1.09	1.47	1.29	1.28	1.26	1.50	1.45	1.64	1.47	1.05	.84	.70
	VB/UINF	-.08	-.41	-.40	-.18	-.09	.17	.35	.48	.55	.38	.33	.12	-.01
	WB/UINF	-.87	-.98	-.09	.40	.71	.63	.08	-.48	-.62	-.79	-1.01	-1.00	-.87
	CP	-.17	-1.10	-1.77	-1.63	-1.45	-1.49	-1.90	-1.46	-1.61	-1.72	-1.18	-.96	-.29
	CPT	.07	.24	-.42	-.76	-.28	-.47	-.51	.13	.80	.23	.07	-.23	-.04

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 5.63   R = 8.03   UINF = 38.7 M/SEC
Z/D = 7.13   PHI = 41.9 DEG

ZB/D \ YB/D	-4.93	-2.47	-.99	-.49	-.01	.49	.99	1.48	1.98	2.47	2.97	3.46	4.94	
	.60	1.28	1.38	1.37	1.13	1.25	1.34	1.58	1.66	1.63	1.18	.82	.62	UB/UINF
	.03	-.31	-.30	-.14	-.07	.13	.24	.40	.49	.50	.42	.32	.11	VB/UINF
1.5	-.87	-.85	.14	.43	.69	.67	.24	-.25	-.56	-.77	-.88	-.97	-.86	WB/UINF
	.08	-1.15	-1.49	-1.65	-1.21	-1.43	-1.78	-1.89	-1.68	-1.61	-1.18	-.78	-.05	CP
	.21	.33	-.47	-.54	-.45	-.39	-.87	-.13	.68	.93	.18	-.04	.09	CPT
	.68	[illegible]	1.58	1.17	1.22	1.27	1.63	1.74	1.73	1.63	1.27	.89	.72	UB/UINF
	.04	-.22	-.09	.05	.04	-.03	.08	.16	.28	.28	.28	.15	-.03	VB/UINF
1.0	-.86	-.84	.08	.63	.83	.77	.39	-.20	-.58	-.82	-.97	-1.06	-.83	WB/UINF
	-.13	-1.81	-1.72	-1.55	-1.64	-1.68	-2.09	-2.10	-1.97	-1.82	-1.57	-.94	-.38	CP
	.08	.11	-.20	-.78	-.45	-.45	-.26	.03	.49	.64	.07	-.00	-.16	CPT
	.67	1.32	1.71	1.57	1.14	1.32	1.56	1.83	1.78	1.56	1.24	.89	.71	UB/UINF
	.08	-.06	-.02	.12	.01	-.25	-.21	-.12	.07	.05	.07	-.04	-.03	VB/UINF
.5	-.88	-.95	.10	.54	.84	.72	.38	-.11	-.65	-.85	-.99	-1.06	-.85	WB/UINF
	-.14	-1.64	-2.00	-1.97	-1.43	-1.72	-1.96	-2.04	-2.08	-1.88	-1.60	-1.07	-.33	CP
	.08	.01	-.05	-.18	-.43	-.38	-.32	.38	.56	.37	-.04	-.13	-.09	CPT
	.69	1.28	1.46	1.26	1.07	1.10	1.42	1.60	1.62	1.36	1.09	.86	.75	UB/UINF
	.13	.30	.29	.20	.11	-.27	-.34	-.28	-.25	-.23	-.28	-.22	-.09	VB/UINF
0.0	-.86	-.80	.13	.67	.81	.75	.32	-.13	-.55	-.83	-.96	-.98	-.85	WB/UINF
	-.18	-1.62	-1.75	-1.20	-1.10	-1.03	-1.68	-2.01	-1.91	-1.75	-1.35	-.99	-.31	CP
	.06	-.22	-.49	-.12	-.28	-.19	-.44	-.32	.13	-.13	-.14	-.23	-.01	CPT
	.74	.98	1.34	1.14	1.13	1.07	1.24	1.32	1.32	1.17	.97	.80	.70	UB/UINF
	.16	.37	.50	.26	-.01	-.26	-.46	-.49	-.45	-.44	-.42	-.45	-.21	VB/UINF
-.5	-.82	-.94	.09	.44	.57	.50	.31	-.14	-.54	-.81	-.89	-.94	-.86	WB/UINF
	-.23	[illegible]	-1.26	-.86	-.89	-.78	-1.05	-1.35	-1.59	-1.38	-1.09	-.63	-.20	CP
	.02	-.02	-.20	-.28	-.29	-.31	-.19	-.32	-.33	-.13	-.17	.11	.08	CPT
	.70	1.07	1.16	1.04	.93	1.07	1.09	1.17	1.10	1.01	.93	.82	.75	UB/UINF
	.22	.47	.54	.24	.06	-.23	-.44	-.54	-.64	-.57	-.46	-.41	-.22	VB/UINF
-1.0	-.82	-.66	.06	.26	.37	.29	.16	-.13	-.46	-.62	-.75	-.81	-.80	WB/UINF
	-.12	-1.05	-.68	-.35	-.35	-.38	-.46	-.77	-.77	-.83	-.87	-.56	-.23	CP
	.08	-.22	-.03	-.13	-.34	-.10	-.03	-.08	.06	-.10	-.22	-.05	.03	CPT
	.76	.88	1.02	1.04	.90	.92	.96	1.01	.99	.84	.83	.77	.74	UB/UINF
	.20	.53	.42	.23	.07	-.18	-.35	-.53	-.59	-.56	-.50	-.48	-.25	VB/UINF
-1.5	-.79	-.67	-.05	.10	.11	.04	-.01	-.22	-.42	-.63	-.75	-.76	-.79	WB/UINF
	-.17	-.48	-.22	-.18	-.20	-.14	-.07	-.23	-.35	-.18	-.29	-.16	-.12	CP
	.08	.04	-.01	-.03	-.37	-.25	-.02	.11	.15	.25	.23	.22	.12	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 7.60 R = 8.04 UINF = 38.8 M/SEC
Z/D = 4.81 PHI = 42.0 DEG

ZB/D \ YB/D	-5.03	-2.51	-1.01	-.50	0.00	.50	1.01	1.51	2.01	2.52	3.02	3.53	5.04	
	.61	.80	1.00	.95	.83	.80	.96	.98	.90	.82	.75	.71	.67	UB/UINF
	.26	.52	.47	.30	.09	-.13	-.31	-.46	-.53	-.52	-.49	-.33	-.16	VB/UINF
1.5	-.78	-.69	-.02	.00	.15	.07	-.01	-.17	-.41	-.61	-.75	-.77	-.81	WB/UINF
	-.03	-.36	-.34	-.15	-.18	-.04	-.07	-.18	-.25	-.23	-.12	-.24	-.07	CP
	.02	.04	-.10	-.16	-.47	-.38	-.05	.02	.01	.10	.23	-.03	.06	CPT
	.70	.79	.91	.93	.84	.87	.93	.90	.90	.83	.81	.79	.76	UB/UINF
	.25	.51	.39	.24	.11	-.10	-.24	-.38	-.47	-.47	-.41	-.38	-.24	VB/UINF
1.0	-.76	-.60	-.21	-.16	-.02	-.08	-.17	-.26	-.39	-.54	-.64	-.68	-.73	WB/UINF
	-.15	-.22	-.06	-.05	-.16	-.05	.03	.02	-.10	-.14	-.24	-.25	-.23	CP
	-.03	.03	-.04	-.09	-.44	-.27	-.00	.05	.09	.07	.00	-.01	-.06	CPT
	.78	.77	.90	.87	.89	.85	.88	.88	.87	.85	.83	.80	.81	UB/UINF
	.22	.43	.32	.18	.06	-.07	-.20	-.29	-.36	-.37	-.36	-.32	-.19	VB/UINF
.5	-.70	-.58	-.29	-.20	-.19	-.16	-.26	-.33	-.42	-.51	-.60	-.67	-.72	WB/UINF
	-.21	-.13	-.00	-.07	-.11	-.08	.08	.07	-.01	-.07	-.14	-.17	-.24	CP
	-.06	-.02	-.00	-.24	-.28	-.33	-.03	.04	.06	.06	.04	.02	-.03	CPT
	.78	.82	.84	.78	.86	.83	.87	.65	.85	.83	.85	.61	.80	UB/UINF
	.24	.40	.26	.14	.06	-.04	-.15	-.21	-.27	-.31	-.32	-.31	-.16	VB/UINF
0.0	-.67	-.53	-.36	-.32	-.25	-.29	-.34	-.39	-.46	-.50	-.56	-.62	-.69	WB/UINF
	-.23	-.11	.02	-.06	-.10	-.01	.07	.11	.07	.00	-.09	-.10	-.21	CP
	-.11	.00	-.08	-.33	-.30	-.23	-.03	.03	.08	.05	.04	.04	-.04	CPT
	.76	.75	.79	.82	.81	.80	.82	.84	.81	.79	.81	.78	.77	UB/UINF
	.21	.30	.19	.10	.08	-.04	-.13	-.18	-.23	-.27	-.26	-.27	-.21	VB/UINF
-.5	-.68	-.55	-.43	-.34	-.36	-.32	-.39	-.44	-.49	-.55	-.57	-.62	-.68	WB/UINF
	-.17	-.04	.04	-.08	-.02	-.04	.06	.08	.09	.06	-.03	-.07	-.17	CP
	-.09	-.09	-.12	-.27	-.22	-.29	-.10	.01	.05	.06	.02	.01	-.06	CPT
	.73	.77	.81	.82	.77	.77	.81	.81	.83	.81	.79	.80	.76	UB/UINF
	.21	.26	.15	.12	.05	-.03	-.08	-.13	-.18	-.19	-.21	-.23	-.18	VB/UINF
-1.0	-.68	-.55	-.46	-.41	-.40	-.40	-.43	-.48	-.50	-.54	-.58	-.61	-.68	WB/UINF
	-.11	-.05	.02	-.05	-.05	-.01	.02	.09	.04	.01	-.00	-.08	-.12	CP
	-.06	-.06	-.09	-.19	-.29	-.26	-.12	-.01	.01	.01	-.00	-.01	-.04	CPT
	.72	.78	.81	.80	.74	.77	.80	.79	.81	.78	.77	.78	.80	UB/UINF
	.17	.20	.14	.07	.03	-.03	-.07	-.11	-.16	-.19	-.21	-.21	-.19	VB/UINF
-1.5	-.70	-.57	-.48	-.45	-.46	-.45	-.47	-.52	-.53	-.57	-.60	-.62	-.64	WB/UINF
	-.06	-.06	-.05	-.13	-.04	-.01	-.01	.05	.03	.04	-.00	-.05	-.17	CP
	-.02	-.08	-.16	-.28	-.27	-.22	-.15	-.03	-.01	.01	-.00	-.02	-.08	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 6.00 R = 8.05 UINF = 38.6 M/SEC PINF = .102E+06 N/M**2
Z/D = 8.00 PHI = 30.0 DEG Q = .950E+03 N/M**2

ZB/D \ YB/D	0.00	.50	.99	1.51	1.99	2.49	
1.5	.96	1.18	1.34	1.72	1.67	1.46	UB/UINF
	-.08	.32	.46	.49	.55	.66	VB/UINF
	.77	.57	.22	-.07	-.18	-.47	WB/UINF
	-.48	-.77	-.98	-1.47	-1.12	-.83	CP
	.04	.07	.07	.75	1.03	.99	CPT
1.0	1.01	1.17	1.41	1.71	1.82	1.62	UB/UINF
	.06	.17	.29	.36	.48	.51	VB/UINF
	.83	.70	.28	-.04	-.26	-.48	WB/UINF
	-.90	-1.05	-1.24	-1.51	-1.26	-1.16	CP
	-.16	-.15	-.07	.58	1.41	.97	CPT
.5	.81	1.17	1.50	1.72	1.67	1.72	UB/UINF
	-.07	-.04	.18	.25	.34	.34	VB/UINF
	1.19	.86	.48	.03	-.42	-.50	WB/UINF
	-.34	-1.06	-1.40	-1.56	-1.41	-1.48	CP
	.75	.06	.13	.48	.72	.88	CPT
0.0	1.01	1.19	1.64	1.80	1.79	1.63	UB/UINF
	-.00	-.00	-.06	.06	.19	.20	VB/UINF
	.97	.88	.49	.01	-.40	-.61	WB/UINF
	-1.17	-1.10	-1.47	-1.64	-1.63	-1.49	CP
	-.19	.10	.48	.64	.81	.60	CPT
-.5	.94	1.09	1.52	1.68	1.78	1.39	UB/UINF
	.02	-.07	-.10	-.15	-.13	.10	VB/UINF
	.95	.92	.47	-.03	-.36	-.72	WB/UINF
	-.80	-.86	-1.42	-1.60	-1.78	-1.06	CP
	.01	.17	.15	.26	.59	.43	CPT
-1.0	.83	1.01	1.38	1.62	1.54	1.29	UB/UINF
	-.03	-.44	-.34	-.35	-.28	-.22	VB/UINF
	.83	.79	.32	-.17	-.44	-.71	WB/UINF
	-.16	-.11	-1.19	-1.58	-1.50	-1.01	CP
	.21	.74	-.05	.23	.17	.22	CPT
-1.5	.83	1.03	1.18	1.22	1.29	1.22	UB/UINF
	.01	-.31	-.40	-.49	-.46	-.52	VB/UINF
	.58	.53	.25	-.09	-.34	-.60	WB/UINF
	.03	-.17	-.62	-.76	-1.03	-.82	CP
	.06	.27	.01	-.03	-.02	.32	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 6.53 R = 8.02 UINF = 38.8 M/SEC
Z/D = 11.35 PHI = 30.0 DEG

ZB/D \ YB/D	-5.22	-2.61	-1.05	-.52	.00	.52	1.05	1.57	2.09	2.62	3.14	3.66	4.19	4.71	5.24	6.28	
1.5	.79	.85	1.00	1.08	1.16	1.24	1.02	1.04	.91	.85	.83	.82	.74	.80	.79	.81	UB/UINF
	-.13	-.23	-.20	-.12	-.01	.13	.20	.24	.30	.33	.27	.27	.24	.20	.18	.14	VB/UINF
	-.54	-.41	-.14	-.06	-.05	.02	-.15	-.14	-.25	-.29	-.37	-.44	-.50	-.49	-.52	-.53	WB/UINF
	.16	.08	.02	-.11	-.12	-.21	-.03	-.15	-.03	.08	.05	.13	.22	.15	.15	.11	CP
	.09	.03	.09	.08	.24	.34	.07	.00	-.04	.00	-.04	.07	.07	.06	.07	.07	CPT
1.0	.82	.98	1.23	1.27	1.42	1.37	1.27	1.32	1.15	1.09	.91	.86	.84	.83	.83	.86	UB/UINF
	-.15	-.36	-.19	-.14	-.00	.12	.22	.32	.33	.37	.31	.32	.25	.19	.17	.11	VB/UINF
	-.56	-.32	-.08	-.01	.02	.02	-.08	-.08	-.17	-.26	-.39	-.44	-.49	-.53	-.53	-.54	WB/UINF
	.03	-.14	-.38	-.36	-.39	-.43	-.27	-.48	-.30	-.31	-.12	-.03	-.01	.06	.06	.00	CP
	.04	.06	.18	.28	.64	.47	.41	.40	.17	.09	-.05	.00	.00	.07	.06	.05	CPT
.5	.81	1.06	1.43	1.42	1.47	1.44	1.46	1.37	1.26	1.15	.99	.91	.83	.88	.86	.84	UB/UINF
	-.18	-.43	-.23	-.12	-.01	.17	.26	.31	.34	.44	.36	.37	.27	.20	.20	.12	VB/UINF
	-.58	-.37	-.06	-.00	.02	.04	-.02	-.04	-.20	-.34	-.44	-.50	-.53	-.53	-.55	-.56	WB/UINF
	.02	-.25	-.51	-.60	-.49	-.56	-.58	-.51	-.40	-.28	-.19	-.10	-.03	-.05	-.01	-.00	CP
	.06	.19	.61	.45	.69	.57	.62	.47	.35	.35	.11	.11	.02	.05	.08	.04	CPT
0.0	.84	1.27	1.35	1.39	1.28	1.20	1.49	1.40	1.27	1.26	1.06	.96	.82	.65	.86	.88	UB/UINF
	-.17	-.43	-.25	-.13	.01	.18	.29	.36	.48	.42	.39	4	.31	.21	.19	.11	VB/UINF
	-.61	-.35	-.05	.07	.07	.02	.01	-.12	-.23	-.32	-.41	-.50	-.60	-.59	-.57	-.57	WB/UINF
	-.01	-.68	-.59	-.60	-.52	-.44	-.75	-.56	-.45	-.57	-.43	-.32	-.06	-.06	-.06	-.05	CP
	.09	.25	.31	.37	.14	.05	.58	.55	.46	.30	.02	-.03	.07	.06	.05	.06	CPT
-.5	.86	1.30	1.20	1.08	1.07	1.07	1.26	1.34	1.35	1.38	1.32	1.02	.87	.82	.84	.83	UB/UINF
	-.13	-.46	-.28	-.12	.01	.16	.35	.39	.49	.44	.43	.45	.34	.24	.18	.11	VB/UINF
	-.65	-.41	.06	.15	.22	.17	.04	-.12	-.20	-.34	-.44	-.55	-.68	-.67	-.62	-.61	WB/UINF
	-.13	-.67	-.51	-.52	-.56	-.59	-.72	-.68	-.69	-.77	-.67	-.39	-.18	-.11	-.08	-.05	CP
	.06	.42	.01	-.32	-.37	-.39	.00	.30	.41	.46	.47	.17	.16	.07	.05	.02	CPT
-1.0	.87	1.24	1.26	1.14	1.00	1.03	1.21	1.40	1.41	1.43	1.22	1.08	.96	.83	.84	.80	UB/UINF
	-.09	-.46	-.32	-.24	.04	.26	.36	.43	.47	.43	.40	.27	.38	.16	.13	.09	VB/UINF
	-.66	-.42	-.10	.30	.44	.40	.10	-.11	-.30	-.39	-.56	-.61	-.62	-.69	-.66	-.64	WB/UINF
	-.22	-.64	-1.02	-.79	-.59	-.50	-.97	-1.11	-.96	-1.07	-.85	-.70	-.49	-.20	-.17	-.01	CP
	-.02	.29	-.30	-.35	-.40	-.21	-.35	.08	.37	.32	.13	-.06	-.05	.00	.00	.05	CPT
-1.5	.85	1.22	1.34	1.16	1.15	1.15	1.20	1.24	1.43	1.52	1.22	1.16	.90	.82	.82	.83	UB/UINF
	-.10	-.44	-.25	-.15	.00	.22	.25	.37	.39	.35	.36	.31	.27	.12	.08	.05	VB/UINF
	-.71	-.53	.15	.43	.53	.39	.09	-.03	-.40	-.55	-.68	-.69	-.79	-.77	-.71	-.65	WB/UINF
	-.22	-.66	-1.13	-1.00	-.91	-1.00	-1.15	-1.06	-1.12	-1.30	-.82	-.83	-.39	-.29	-.21	-.12	CP
	.02	.32	-.24	-.44	-.30	-.47	-.64	-.38	.26	.44	.28	.11	.13	-.00	-.02	-.00	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 8.81   R = 8.03   UINF = 38.5 M/SEC
Z/D = 8.31   PHI = 30.0 DEG

ZB/D \ YB/D	-5.09	-2.58	-1.07	-.57	-.06	.45	.95	1.46	1.96	2.47	2.98	3.48	3.99	4.49	5.00	6.01	
1.5	.75	1.40	1.23	1.09	1.04	1.00	1.15	1.48	1.48	1.31	1.31	1.23	1.06	.86	.70	.75	UB/UINF
	.05	-.21	-.13	-.07	-.03	-.03	-.00	.15	.22	.30	.28	.29	.22	.19	.15	.05	VB/UINF
	-.74	-.54	.31	.59	.71	.70	.51	.22	-.14	-.56	-.69	-.74	-.77	-.78	-.83	-.70	WB/UINF
	.16	-.93	-.73	-.51	-.71	-.56	-.80	-1.25	-1.18	-.65	-.52	-.60	-.36	-.18	.23	.22	CP
	.28	.39	-.11	.04	-.11	-.05	-.22	.03	.10	.49	.76	.56	.41	.22	.43	.27	CPT
1.0	.83	1.45	1.44	1.26	1.13	1.07	1.35	1.45	1.65	1.60	1.45	1.25	1.07	.94	.79	.85	UB/UINF
	.02	-.03	.04	-.01	.05	-.14	-.08	-.02	.02	.07	.15	.08	.03	.06	-.02	-.02	VB/UINF
	-.74	-.59	.18	.62	.73	.77	.48	.14	-.20	-.49	-.64	-.76	-.82	-.79	-.77	-.66	WB/UINF
	-.02	-.95	-.92	-1.01	-.91	-.80	-1.15	-1.30	-1.38	-1.26	-1.04	-.81	-.60	-.35	-.01	.04	CP
	.23	.53	.22	-.04	-.09	-.03	-.06	-.18	.39	.58	.53	.35	.22	.16	.22	.19	CPT
.5	.85	1.38	1.41	1.08	.95	1.13	1.25	1.46	1.52	1.48	1.39	1.20	1.04	.92	.80	.84	UB/UINF
	.10	.04	.21	.11	-.03	-.14	-.19	-.19	-.13	-.08	-.05	-.07	-.06	-.12	-.11	-.05	VB/UINF
	-.70	-.53	.26	.63	.74	.69	.50	.16	-.16	-.53	-.67	-.76	-.84	-.81	-.76	-.67	WB/UINF
	-.08	-1.00	-1.16	-.62	-.48	-.73	-.98	-1.15	-1.22	-1.06	-.97	-.79	-.49	-.22	-.01	.03	CP
	.14	.19	-.05	-.04	-.02	.05	-.12	.05	.16	.44	.43	.26	.30	.30	.23	.18	CPT
0.0	.88	1.25	1.35	1.24	1.00	1.04	1.15	1.29	1.44	1.42	1.27	1.13	1.05	.89	.91	.88	UB/UINF
	.14	.25	.23	.12	.06	-.09	-.29	-.35	-.31	-.23	-.27	-.21	-.10	-.18	-.16	-.06	VB/UINF
	-.69	-.61	.24	.50	.61	.56	.49	.19	-.21	-.43	-.67	-.76	-.79	-.77	-.72	-.65	WB/UINF
	-.09	-.74	-1.06	-.72	-.43	-.59	-.61	-.82	-.98	-1.03	-.76	-.61	-.51	-.17	-.12	.00	CP
	.20	.26	-.12	.09	-.04	-.17	.04	.00	.24	.24	.39	.30	.23	.27	.25	.21	CPT
-.5	.89	1.08	1.19	1.08	1.00	.96	1.10	1.15	1.23	1.20	1.14	1.02	.91	.80	.86	.85	UB/UINF
	.15	.39	.36	.25	.07	-.12	-.33	-.41	-.45	-.44	-.40	-.34	-.34	-.33	-.23	-.15	VB/UINF
	-.65	-.54	.21	.36	.43	.45	.33	.17	-.18	-.42	-.60	-.71	-.73	-.77	-.68	-.63	WB/UINF
	-.09	-.48	-.35	-.24	-.24	-.25	-.41	-.55	-.72	-.68	-.61	-.46	-.24	-.00	-.02	.06	CP
	.15	.14	.26	.12	-.03	-.11	.03	-.02	.03	.14	.22	.19	.25	.34	.23	.21	CPT
-1.0	.87	.99	1.07	1.06	.90	.97	1.06	1.04	1.08	1.07	1.04	.93	.91	.90	.89	.84	UB/UINF
	.22	.41	.33	.15	.06	-.13	-.26	-.42	-.47	-.51	-.41	-.43	-.34	-.33	-.24	-.13	VB/UINF
	-.63	-.52	.23	.31	.31	.27	.22	.06	-.15	-.37	-.53	-.61	-.67	-.66	-.65	-.62	WB/UINF
	-.02	-.24	-.07	-.10	.01	-.06	-.12	-.15	-.29	-.38	-.34	-.19	-.11	-.01	.00	.10	CP
	.19	.18	.23	.15	-.08	-.02	.12	.12	.12	.18	.19	.25	.29	.34	.29	.22	CPT
-1.5	.80	.98	1.02	.99	.95	.92	.95	.99	.97	1.02	.98	.86	.88	.84	.80	.89	UB/UINF
	.24	.46	.25	.20	.07	-.17	-.22	-.35	-.42	-.46	-.46	-.41	-.32	-.31	-.23	-.18	VB/UINF
	-.63	-.43	-.04	.09	.11	.05	.08	-.02	-.18	-.35	-.46	-.57	-.59	-.63	-.66	-.60	WB/UINF
	.14	-.07	.02	.12	.00	.04	.08	.03	-.03	-.09	-.07	.04	.02	.05	.17	.06	CP
	.23	.29	.12	.15	-.07	-.09	.05	.15	.13	.28	.31	.28	.25	.26	.30	.24	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 10.00 R = 8.02 UINF = 38.6 M/SEC
Z/D = 5.31 PHI = 30.0 DEG

ZB/D \ YB/D	-4.94	-2.47	-1.00	-.50	0.00	.50	1.00	1.48	1.98	2.48	2.98	3.47	3.97	4.46	4.96	5.95	
1.5	.79	.94	.98	.88	.92	.88	.93	.94	.95	.95	.88	.87	.86	.82	.69	.83	UB/UINF
	.22	.45	.30	.23	.06	-.07	-.22	-.31	-.37	-.40	-.37	-.34	-.25	-.21	-.20	-.11	VB/UINF
	-.60	-.34	-.01	.10	.04	.07	-.01	-.09	-.23	-.37	-.47	-.55	-.59	-.62	-.67	-.59	WB/UINF
	.12	-.06	.03	.12	-.00	.03	.09	.07	.02	-.02	.05	.02	.00	.05	.26	.09	CP
	.15	.16	.08	-.04	-.15	-.18	.00	.06	.13	.16	.20	.21	.16	.15	.22	.14	CPT
1.0	.87	.94	.95	.97	.95	.93	.94	.95	.92	.90	.92	.89	.87	.90	.85	.85	UB/UINF
	.21	.42	.26	.15	.06	-.08	-.19	-.27	-.32	-.37	-.37	-.33	-.29	-.26	-.24	-.15	VB/UINF
	-.54	-.34	-.14	-.05	-.02	-.03	-.08	-.15	-.24	-.36	-.39	-.49	-.52	-.54	-.55	-.57	WB/UINF
	.03	-.00	.16	.07	-.00	-.05	.05	.09	.10	.09	.03	.02	.02	-.02	.05	.06	CP
	.14	.18	.15	.05	-.10	-.16	-.02	.08	.11	.16	.17	.17	.14	.15	.13	.13	CPT
.5	.89	.92	.91	.88	.92	.89	.93	.94	.94	.93	.93	.92	.90	.92	.89	.89	UB/UINF
	.23	.31	.19	.10	.05	-.10	-.15	-.21	-.27	-.28	-.29	-.30	-.27	-.27	-.22	-.15	VB/UINF
	-.52	-.34	-.20	-.13	-.11	-.14	-.16	-.23	-.28	-.34	-.39	-.43	-.47	-.50	-.56	-.55	WB/UINF
	.04	.08	.16	.10	.01	.01	.06	.10	.12	.10	.07	.04	.06	.01	.03	.03	CP
	.16	.15	.07	-.10	-.13	-.17	-.02	.08	.16	.16	.16	.17	.18	.18	.18	.13	CPT
0.0	.92	.91	.89	.89	.84	.89	.93	.93	.92	.92	.90	.91	.88	.85	.89	.89	UB/UINF
	.23	.25	.16	.11	.02	-.08	-.10	-.17	-.21	-.23	-.26	-.25	-.23	-.23	-.18	-.14	VB/UINF
	-.50	-.35	-.26	-.22	-.21	-.19	-.23	-.26	-.31	-.35	-.39	-.43	-.47	-.54	-.52	-.52	WB/UINF
	.03	.12	.16	.14	.04	.02	.06	.11	.14	.12	.14	.09	.11	.11	.06	.08	CP
	.18	.14	.05	.00	-.20	-.15	-.01	.07	.13	.14	.18	.17	.16	.18	.16	.17	CPT
-.5	.86	.90	.90	.89	.85	.83	.90	.91	.91	.90	.90	.88	.88	.84	.89	.85	UB/UINF
	.20	.23	.15	.10	.02	-.04	-.08	-.13	-.17	-.20	-.22	-.24	-.21	-.21	-.21	-.18	VB/UINF
	-.49	-.37	-.30	-.26	-.27	-.28	-.29	-.30	-.34	-.37	-.40	-.43	-.45	-.49	-.50	-.51	WB/UINF
	.09	.12	.18	.13	.07	.07	.07	.10	.15	.15	.14	.12	.13	.11	.06	.10	CP
	.12	.12	.10	.00	-.13	-.15	-.03	.04	.12	.15	.16	.14	.15	.11	.14	.12	CPT
-1.0	.90	.91	.91	.87	.83	.87	.87	.91	.90	.87	.91	.89	.90	.88	.86	.90	UB/UINF
	.19	.20	.12	.08	.02	-.04	-.07	-.11	-.14	-.16	-.17	-.19	-.18	-.17	-.17	-.16	VB/UINF
	-.47	-.38	-.33	-.30	-.28	-.29	-.31	-.33	-.36	-.39	-.40	-.43	-.45	-.47	-.49	-.49	WB/UINF
	.09	.14	.15	.10	.05	.03	.06	.10	.14	.17	.15	.12	.10	.10	.12	.05	CP
	.16	.16	.10	-.05	-.17	-.12	-.08	.05	.10	.12	.16	.13	.15	.13	.12	.13	CPT
-1.5	.87	.88	.88	.87	.83	.83	.85	.87	.89	.89	.88	.88	.87	.88	.88	.86	UB/UINF
	.17	.16	.10	.04	.01	-.02	-.07	-.10	-.13	-.14	-.16	-.16	-.18	-.16	-.16	-.14	VB/UINF
	-.49	-.40	-.33	-.31	-.31	-.32	-.35	-.37	-.38	-.41	-.42	-.45	-.44	-.48	-.49	-.49	WB/UINF
	.08	.16	.10	.06	.06	.02	.05	.10	.12	.14	.15	.12	.11	.09	.07	.10	CP
	.10	.12	-.00	-.07	-.15	-.19	-.09	.01	.08	.12	.13	.12	.11	.13	.11	.10	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 11.91 R = 8.03 UINF = 38.5 M/SEC
Z/D = 2.28 PHI = 30.0 DEG

ZH/D \ YH/D	-5.01	-2.52	-1.00	-.50	0.00	.50	1.01	1.51	2.01	2.51	3.02	3.52	4.03	4.53	5.03	6.03	
1.5	.84	.82	.84	.75	.78	.79	.79	.86	.84	.82	.84	.83	.84	.83	.85	.84	UB/UINF
	.18	.19	.13	.09	.06	.03	-.01	-.03	-.07	-.08	-.08	-.10	-.09	-.11	-.09	-.07	VB/UINF
	-.49	-.44	-.40	-.39	-.38	-.35	-.43	-.40	-.41	-.45	-.45	-.47	-.48	-.48	-.49	-.51	WB/UINF
	.12	.20	.16	.17	.15	.09	.23	.15	.21	.22	.18	.19	.20	.16	.14	.14	CP
	.11	.10	.03	-.10	-.10	-.16	.04	.04	.09	.10	.10	.12	.13	.10	.11	.11	CPT
1.0	.87	.88	.88	.82	.85	.85	.84	.89	.83	.86	.88	.89	.87	.88	.87	.85	UB/UINF
	.14	.15	.08	.05	.03	-.00	-.05	-.06	-.06	-.08	-.09	-.10	-.11	-.13	-.10	-.10	VB/UINF
	-.47	-.42	-.40	-.39	-.37	-.36	-.40	-.40	-.43	-.43	-.43	-.44	-.46	-.46	-.47	-.49	WB/UINF
	.07	.10	.11	.05	.05	.08	.12	.08	.15	.15	.09	.10	.13	.07	.10	.09	CP
	.06	.09	.05	-.12	-.08	-.07	-.01	.03	.03	.07	.06	.10	.11	.08	.09	.07	CPT
.5	.89	.91	.87	.85	.82	.84	.83	.88	.90	.89	.90	.89	.87	.90	.91	.91	UB/UINF
	.15	.11	.08	.04	.03	.02	-.03	-.07	-.08	-.09	-.08	-.11	-.10	-.11	-.11	-.11	VB/UINF
	-.48	-.43	-.40	-.41	-.40	-.39	-.41	-.42	-.44	-.44	-.43	-.45	-.46	-.47	-.48	-.48	WB/UINF
	.05	.06	.07	.06	.07	.06	.08	.08	.07	.11	.07	.08	.11	.06	.05	.04	CP
	.09	.08	-.00	-.05	-.10	-.07	-.07	.05	.08	.11	.09	.09	.10	.11	.11	.11	CPT
0.0	.92	.90	.87	.80	.80	.84	.86	.84	.88	.90	.90	.90	.87	.90	.90	.89	UB/UINF
	.16	.14	.06	.03	.05	-.01	-.02	-.05	-.06	-.08	-.10	-.09	-.10	-.14	-.10	-.11	VB/UINF
	-.46	-.44	-.42	-.46	-.41	-.38	-.38	-.43	-.45	-.45	-.44	-.45	-.47	-.46	-.47	-.47	WB/UINF
	-.00	.06	.06	.10	.07	.02	.01	.07	.06	.08	.08	.07	.14	.05	.05	.07	CP
	.09	.09	-.01	-.05	-.12	-.13	-.10	-.05	.05	.10	.10	.09	.14	.10	.09	.10	CPT
-.5	.86	.87	.83	.80	.79	.80	.79	.84	.87	.86	.87	.87	.90	.88	.88	.89	UB/UINF
	.15	.10	.07	.02	.03	-.02	-.02	-.04	-.05	-.07	-.08	-.10	-.10	-.09	-.11	-.09	VB/UINF
	-.48	-.45	-.46	-.44	-.43	-.45	-.44	-.44	-.45	-.46	-.46	-.47	-.45	-.47	-.47	-.46	WB/UINF
	.08	.10	.10	.03	.06	.12	.08	.05	.07	.10	.08	.09	.09	.06	.05	.07	CP
	.08	.07	.01	-.13	-.12	-.04	-.09	-.04	.04	.06	.05	.06	.11	.07	.06	.08	CPT
-1.0	.87	.87	.83	.75	.83	.78	.83	.75	.87	.86	.87	.90	.86	.88	.88	.90	UB/UINF
	.16	.11	.07	.05	.03	.01	-.03	-.06	-.06	-.06	-.09	-.08	-.07	-.10	-.11	-.10	VB/UINF
	-.49	-.44	-.44	-.49	-.44	-.48	-.39	-.49	-.45	-.47	-.47	-.46	-.48	-.47	-.47	-.44	WB/UINF
	.04	.05	.04	.11	.05	.13	-.03	.15	.02	.09	.08	.03	.12	.07	.04	.03	CP
	.06	.03	-.07	-.08	-.06	-.03	-.18	-.04	-.00	.04	.08	.06	.11	.07	.06	.05	CPT
-1.5	.79	.87	.81	.77	.78	.80	.78	.83	.79	.83	.86	.85	.85	.84	.81	.83	UB/UINF
	.11	.09	.03	.07	.00	-.03	-.01	-.05	-.04	-.06	-.07	-.06	-.08	-.11	-.08	-.12	VB/UINF
	-.58	-.46	-.47	-.48	-.48	-.47	-.48	-.45	-.48	-.49	-.48	-.48	-.48	-.50	-.50	-.44	WB/UINF
	.08	.04	.05	.06	.08	.05	.11	.02	.07	.10	.06	.04	.10	.07	.07	.05	CP
	.06	.03	-.07	-.10	-.08	-.09	-.06	-.08	-.08	.03	.03	.00	.07	.04	-.02	-.05	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 12.10 R = 8.03 UINF = 38.5 M/SEC
Z/D = 16.97 PHI = 20.0 DEG

ZB/D \ YB/D	-5.28	-2.67	-1.10	-.58	-.05	.47	1.01	1.52	2.05	2.57	3.10	3.62	4.15	4.67	5.21	6.25	
1.5	.90	.92	.92	.90	.90	.91	.91	.91	.90	.90	.92	.90	.89	.90	.91	.91	UR/UINF
	-.06	-.06	-.02	-.01	.01	.01	.04	.06	.07	.10	.09	.11	.12	.11	.11	.11	VR/UINF
	-.33	-.28	-.26	-.25	-.25	-.25	-.25	-.26	-.27	-.27	-.28	-.30	-.30	-.30	-.31	-.33	WR/UINF
	.17	.17	.17	.19	.23	.24	.21	.20	.20	.20	.17	.19	.20	.16	.16	.15	CP
	.10	.09	.09	.07	.10	.13	.11	.10	.09	.09	.11	.10	.10	.09	.09	.10	CPT
1.0	.93	.94	.95	.94	.95	.95	.94	.93	.93	.97	.94	.95	.93	.94	.93	.94	UR/UINF
	-.10	-.09	-.07	-.03	-.01	.01	.04	.05	.07	.07	.09	.09	.10	.10	.10	.10	VR/UINF
	-.31	-.25	-.22	-.22	-.21	-.21	-.20	-.22	-.23	-.24	-.26	-.28	-.28	-.28	-.30	-.31	WR/UINF
	.13	.12	.12	.10	.14	.17	.16	.17	.16	.09	.13	.12	.12	.11	.11	.07	CP
	.11	.08	.08	.04	.09	.12	.08	.09	.09	.09	.10	.11	.09	.09	.08	.06	CPT
.5	.95	.96	.94	.95	.97	.95	.95	.94	.96	.96	.94	.94	.95	.95	.95	.96	UR/UINF
	-.11	-.11	-.06	-.06	-.03	-.00	.02	.06	.06	.10	.09	.10	.11	.11	.11	.08	VR/UINF
	-.31	-.24	-.20	-.20	-.19	-.20	-.19	-.20	-.23	-.23	-.25	-.28	-.28	-.30	-.30	-.33	WR/UINF
	.08	.09	.11	.10	.10	.17	.14	.11	.11	.11	.12	.13	.12	.11	.09	.08	CP
	.09	.08	.04	.06	.08	.11	.07	.05	.08	.10	.08	.10	.11	.11	.10	.12	CPT
0.0	.95	.98	.99	.92	.96	.97	.95	.95	.97	.95	.95	.94	.95	.94	.95	.95	UR/UINF
	-.13	-.15	-.07	-.06	-.03	.03	.05	.08	.08	.11	.14	.12	.13	.12	.12	.11	VR/UINF
	-.33	-.23	-.17	-.15	-.17	-.16	-.17	-.17	-.21	-.23	-.24	-.25	-.29	-.30	-.30	-.33	WR/UINF
	.10	.05	.05	.10	.08	.13	.12	.10	.06	.12	.13	.04	.06	.09	.07	.07	CP
	.14	.09	.06	-.02	.03	.10	.06	.03	.06	.08	.11	.06	.10	.08	.09	.10	CPT
-.5	.95	.97	1.02	1.00	.98	.96	.98	.99	.99	.96	.98	.94	.94	.94	.94	.93	UR/UINF
	-.13	-.17	-.10	-.08	-.03	.02	.06	.09	.13	.14	.14	.14	.15	.15	.14	.12	VR/UINF
	-.33	-.22	-.13	-.12	-.11	-.16	-.14	-.13	-.20	-.21	-.23	-.26	-.26	-.31	-.32	-.33	WR/UINF
	.07	.06	-.04	.00	.07	.09	.10	.04	.08	.08	.07	.11	.10	.10	.10	.10	CP
	.12	.09	.04	.04	.04	.05	.09	.05	.11	.08	.11	.09	.08	.10	.11	.08	CPT
-1.0	.93	1.01	1.05	1.06	1.04	1.07	1.07	1.01	1.01	1.02	.98	.97	.96	.93	.94	.95	UR/UINF
	-.16	-.15	-.11	-.07	-.00	.04	.07	.12	.14	.15	.15	.15	.16	.15	.14	.13	VR/UINF
	-.37	-.23	-.11	-.08	-.10	-.09	-.13	-.11	-.13	-.20	-.22	-.24	-.29	-.30	-.33	-.35	WR/UINF
	.11	.00	-.05	-.05	-.03	-.01	-.02	-.01	-.02	.02	.05	.05	.06	.05	.06	.05	CP
	.13	.09	.08	.08	.06	.15	.16	.03	.05	.12	.08	.07	.11	.05	.08	.08	CPT
-1.5	.92	1.02	1.04	1.09	1.09	1.11	1.11	1.13	1.05	1.04	.99	.98	.96	.95	.96	.92	UR/UINF
	-.16	-.20	-.13	-.07	-.02	.04	.09	.13	.17	.21	.20	.21	.16	.17	.16	.13	VR/UINF
	-.37	-.24	-.11	-.06	-.05	-.08	-.10	[illegible]	-.12	-.15	-.23	-.26	-.31	-.33	-.35	-.36	WR/UINF
	.08	-.01	-.03	-.05	-.06	.01	-.05	-.11	-.08	-.07	.02	.03	.03	.05	.03	.06	CP
	.09	.13	.09	.16	.14	.25	.20	.20	.07	.10	.09	.11	.09	.09	.10	.05	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 13.10   R = 8.03   UINF = 38.5 M/SEC
Z/D = 14.16   PHI = 20.0 DEG

ZB/D \ YB/D	-5.15	-2.58	-1.04	-.53	0.00	.52	1.03	1.55	2.07	2.58	3.10	3.62	4.14	4.65	5.17	6.20	
	.92	1.03	1.07	1.06	1.15	1.11	1.14	1.07	1.06	1.03	.93	.94	.91	.96	.90	.89	UB/UINF
	-.12	-.20	-.09	-.04	.01	.08	.12	.19	.19	.27	.25	.24	.23	.22	.17	.16	VB/UINF
1.5	-.38	-.22	-.09	-.04	-.06	-.06	-.06	-.12	-.16	-.19	-.21	-.26	-.31	-.33	-.35	-.37	WB/UINF
	.16	-.02	-.00	-.02	-.14	-.05	-.08	-.07	-.12	-.04	.03	.04	.07	.01	.12	.14	CP
	.16	.13	.16	.12	.19	.19	.24	.13	.07	.13	-.00	.06	.05	.10	.08	.10	CPT
	.93	1.14	1.05	1.13	1.12	1.11	1.15	1.12	1.09	1.14	1.06	.99	1.00	.97	.94	.94	UB/UINF
	-.15	-.19	-.15	-.07	.02	.10	.12	.20	.19	.21	.24	.26	.23	.22	.19	.16	VB/UINF
1.0	-.36	-.16	-.08	-.02	.00	.01	-.05	-.11	-.11	-.16	-.20	-.26	-.28	-.33	-.35	-.38	WB/UINF
	.04	-.14	-.07	-.16	-.15	-.13	-.16	-.18	-.21	-.17	-.16	-.02	-.07	-.01	.04	.04	CP
	.06	.23	.07	.11	.11	.12	.18	.12	.03	.20	.07	.11	.06	.09	.09	.10	CPT
	.94	1.16	1.10	1.06	1.06	1.04	1.15	1.09	1.13	1.17	1.12	1.05	1.02	1.01	.95	.93	UB/UINF
	-.17	-.22	-.18	-.13	-.03	.11	.14	.20	.22	.26	.30	.28	.24	.26	.20	.14	VB/UINF
.5	-.41	-.19	.00	.04	.03	.03	-.01	-.00	-.14	-.18	-.22	-.28	-.32	-.34	-.37	-.40	WB/UINF
	.05	-.20	-.20	-.17	-.14	-.22	-.21	-.31	-.28	-.26	-.17	-.16	-.13	-.09	-.01	.04	CP
	.14	.23	.05	-.01	-.02	-.12	.15	-.07	.08	.21	.23	.11	.08	.12	.08	.09	CPT
	.93	1.18	1.08	.97	1.06	1.04	1.00	1.05	1.09	1.15	1.12	1.09	.99	1.02	1.01	.91	UB/UINF
	-.21	-.28	-.21	-.08	-.02	.13	.14	.23	.30	.31	.33	.35	.31	.24	.24	.15	VB/UINF
0.0	-.42	-.17	.00	.06	.11	.10	.12	-.01	-.11	-.20	-.25	-.29	-.36	-.36	-.40	-.42	WB/UINF
	.05	-.26	-.24	-.21	-.21	-.27	-.21	-.29	-.33	-.33	-.21	-.20	-.04	-.13	-.09	.03	CP
	.12	.24	-.03	-.25	-.07	-.17	-.18	-.13	-.02	.14	.23	.20	.18	.10	.15	.06	CPT
	.94	1.06	1.12	1.01	1.04	1.04	1.01	1.15	1.06	1.19	1.11	1.07	1.13	1.03	.97	.93	UB/UINF
	-.22	-.33	-.21	-.12	-.02	.14	.20	.32	.36	.31	.31	.31	.31	.23	.25	.13	VB/UINF
-.5	-.44	-.20	.10	.23	.23	.17	.11	.03	-.14	-.19	-.28	-.32	-.36	-.41	-.42	-.43	WB/UINF
	-.05	-.19	-.43	-.25	-.32	-.35	-.36	-.45	-.35	-.43	-.35	-.22	-.26	-.20	-.10	-.01	CP
	.08	.09	-.11	-.16	-.19	-.21	-.27	-.02	-.07	.14	.07	.13	.27	.09	.09	.06	CPT
	.96	1.07	1.05	1.09	1.03	.96	.98	1.05	1.10	1.12	1.18	1.10	1.08	1.09	.98	.92	UB/UINF
	-.20	-.29	-.26	-.06	-.01	.16	.23	.29	.32	.33	.31	.33	.30	.25	.24	.14	VB/UINF
-1.0	-.49	-.23	.26	.27	.35	.28	.19	.12	.03	-.22	-.28	-.37	-.39	-.41	-.50	-.46	WB/UINF
	-.05	-.42	-.40	-.48	-.43	-.22	-.42	-.42	-.46	-.53	-.48	-.30	-.25	-.32	-.07	-.01	CP
	.16	-.14	-.15	-.22	-.24	-.19	-.36	-.21	-.15	-.10	.10	.17	.17	.11	.21	.07	CPT
	.93	1.16	1.05	.87	1.02	.98	1.04	1.11	1.21	1.12	1.21	1.16	1.08	1.08	.97	.93	UB/UINF
	-.19	-.30	-.21	-.17	-.01	.14	.15	.28	.28	.34	.27	.30	.27	.22	.20	.14	VB/UINF
-1.5	-.56	-.22	.22	.45	.43	.38	.38	.14	-.04	-.29	-.29	-.49	-.47	-.51	-.52	-.49	WB/UINF
	-.08	-.55	-.46	-.24	-.49	-.41	-.46	-.60	-.80	-.58	-.57	-.45	-.35	-.26	-.19	-.06	CP
	.15	-.06	-.27	-.25	-.13	-.28	-.22	-.27	-.24	-.13	.06	.24	.11	.23	.07	.07	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 14.00 R = 8.03 UINF = 39.3 M/SEC
Z/D = 15.30 PHI = 20.0 DEG

ZB/D \ YB/D	-.51	-.01	.49	.99	1.49	1.98	2.48	2.98	3.48	3.98	4.48	
1.5	1.01	1.08	1.06	.98	1.05	.99	.97	.97	.95	.94	.94	UB/UINF
	-.09	-.00	.08	.10	.14	.14	.18	.19	.20	.20	.21	VB/UINF
	-.12	-.11	-.12	-.12	-.16	-.18	-.21	-.22	-.26	-.30	-.31	WB/UINF
	-.08	-.21	-.18	-.11	-.19	-.15	-.10	-.12	-.08	-.05	-.07	CP
	-.04	-.03	-.03	-.12	-.05	-.12	-.07	-.09	-.07	-.03	-.05	CPT
1.0	1.06	1.10	1.10	1.03	1.05	1.04	.99	.97	.97	.94	.96	UB/UINF
	-.05	-.00	.07	.10	.15	.15	.20	.20	.21	.24	.19	VB/UINF
	-.08	-.05	-.10	-.07	-.07	-.12	-.18	-.24	-.23	-.30	-.30	WB/UINF
	-.18	-.21	-.17	-.13	-.21	-.19	-.15	-.13	-.13	-.08	-.10	CP
	-.04	.00	.06	-.05	-.08	-.08	-.09	-.09	-.07	-.05	-.04	CPT
.5	1.16	1.12	1.16	1.08	1.09	1.07	1.07	1.03	1.06	.98	.97	UB/UINF
	-.06	-.02	.07	.14	.17	.22	.22	.28	.23	.25	.22	VB/UINF
	-.05	-.01	-.04	-.04	-.07	-.13	-.15	-.22	-.25	-.30	-.31	WB/UINF
	-.32	-.25	-.29	-.29	-.22	-.24	-.27	-.14	-.22	-.10	-.14	CP
	.05	.02	.06	-.10	.01	-.03	-.05	.05	.03	.01	-.06	CPT
0.0	1.10	1.08	1.08	1.08	1.08	1.13	1.13	1.13	1.05	.95	.95	UB/UINF
	-.10	-.04	.06	.16	.20	.22	.26	.25	.27	.27	.26	VB/UINF
	.04	.02	.02	.04	-.02	-.09	-.15	-.19	-.24	-.28	-.35	WB/UINF
	-.34	-.29	-.18	-.27	-.34	-.34	-.32	-.35	-.19	-.13	-.13	CP
	-.11	-.12	-.01	-.07	-.12	.00	.05	.03	.05	-.08	-.03	CPT
-.5	1.05	1.03	1.00	1.04	1.07	1.11	1.06	1.11	1.03	1.06	1.03	UB/UINF
	-.15	-.04	.12	.15	.21	.27	.28	.25	.30	.26	.26	VB/UINF
	.02	.07	.10	.05	-.02	-.03	-.10	-.20	-.26	-.30	-.34	WB/UINF
	-.36	-.34	-.30	-.33	-.33	-.32	-.36	-.31	-.28	-.28	-.26	CP
	-.23	-.28	-.26	-.22	-.13	-.01	-.15	.04	-.07	.01	-.01	CPT
-1.0	1.02	1.03	1.00	1.08	1.04	1.07	1.25	1.09	1.09	1.11	.98	UB/UINF
	-.13	-.04	.11	.20	.20	.34	.28	.34	.32	.30	.28	VB/UINF
	.19	.25	.17	.09	.07	-.00	-.09	-.27	-.33	-.32	-.40	WB/UINF
	-.45	-.37	-.37	-.52	-.39	-.45	-.62	-.39	-.36	-.40	-.19	CP
	-.35	-.23	-.33	-.29	-.25	-.18	.03	.00	.04	.02	.03	CPT
-1.5	1.06	.99	1.00	.94	1.07	1.20	1.13	1.08	1.09	1.08	1.08	UB/UINF
	-.15	-.02	.10	.24	.29	.32	.34	.39	.37	.30	.26	VB/UINF
	.30	.30	.33	.24	.10	.02	-.12	-.23	-.35	-.36	-.42	WB/UINF
	-.51	-.45	-.33	-.35	-.53	-.56	-.53	-.43	-.38	-.42	-.42	CP
	-.27	-.37	-.21	-.34	-.28	-.02	-.12	-.05	.08	-.03	-.00	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 15.18 R = 8.03 UINF = 39.3 M/SEC
Z/D = 11.98 PHI = 20.0 DEG

ZB/D \ YB/D	-.49	0.00	.51	.99	1.48	1.98	2.48	2.95	3.45	3.94	4.44	
1.5	1.24	1.02	.93	1.05	1.14	1.12	1.18	1.18	1.15	1.10	1.03	UB/UINF
	-.14	-.00	-.01	.22	.30	.35	.40	.39	.33	.30	.26	VB/UINF
	.34	.45	.43	.41	.21	-.07	-.22	-.24	-.40	-.44	-.47	WB/UINF
	-.84	-.54	-.51	-.48	-.66	-.71	-.71	-.71	-.55	-.54	-.37	CP
	-.17	-.30	-.45	-.16	-.22	-.32	-.11	-.10	.04	-.03	-.02	CPT
1.0	1.00	1.02	1.03	.97	1.07	1.23	1.20	1.23	1.19	1.23	1.10	UB/UINF
	-.04	.02	.12	.15	.26	.26	.22	.31	.27	.27	.26	VB/UINF
	.48	.56	.54	.45	.37	.01	-.17	-.30	-.40	-.47	-.51	WB/UINF
	-.63	-.53	-.61	-.55	-.67	-.84	-.84	-.77	-.68	-.65	-.44	CP
	-.39	-.18	-.24	-.38	-.32	-.26	-.31	-.06	-.03	.17	.10	CPT
.5	1.00	.91	1.04	1.13	1.23	1.38	1.22	1.25	1.27	1.30	1.11	UB/UINF
	-.07	-.07	.09	-.00	.20	.18	.24	.26	.20	.17	.20	VB/UINF
	.54	.60	.59	.45	.36	.08	-.09	-.39	-.37	-.46	-.57	WB/UINF
	-.67	-.54	-.60	-.75	-.87	-1.07	-.81	-.70	-.97	-.82	-.49	CP
	-.37	-.34	-.16	-.25	-.16	-.11	-.25	.09	-.17	.14	.11	CPT
0.0	1.04	1.07	1.14	1.16	1.21	1.39	1.43	1.17	1.18	1.22	1.11	UB/UINF
	.05	-.02	.03	-.01	.12	.13	.09	.20	.14	.11	.10	VB/UINF
	.56	.64	.59	.55	.25	.04	-.12	-.42	-.43	-.52	-.56	WB/UINF
	-.66	-.64	-.7	-.70	-.88	-.98	-1.05	-.68	-.79	-.72	-.45	CP
	-.24	-.08	-.08	-.05	-.34	-.01	.05	-.09	-.18	.05	.11	CPT
-.5	1.16	1.02	1.13	1.12	1.27	1.49	1.38	1.40	1.29	1.25	1.11	UB/UINF
	.04	.12	-.04	.02	-.02	.01	.04	.02	.06	.05	.07	VB/UINF
	.51	.60	.56	.54	.31	.03	-.15	-.40	-.52	-.53	-.58	WB/UINF
	-.77	-.59	-.71	-.81	-.76	-1.23	-1.05	-.88	-.69	-.77	-.54	CP
	-.16	-.18	-.11	-.25	-.05	-.01	-.11	.25	.24	.09	.03	CPT
-1.0	1.02	.99	1.09	1.08	1.28	1.37	1.47	1.39	1.17	1.14	1.13	UB/UINF
	.19	-.02	-.03	-.13	-.13	-.12	-.04	-.07	-.02	-.03	-.05	VB/UINF
	.47	.56	.55	.52	.28	.02	-.21	-.38	-.51	-.56	-.59	WB/UINF
	-.51	-.43	-.54	-.46	-.87	-.84	-1.11	-.78	-.68	-.44	-.58	CP
	-.19	-.13	-.04	-.00	-.11	.07	.11	.31	-.03	.19	.05	CPT
-1.5	1.06	.98	1.10	1.12	1.26	1.31	1.34	1.32	1.33	1.19	1.10	UB/UINF
	.15	.01	-.07	-.12	-.17	-.17	-.18	-.16	-.08	-.05	-.09	VB/UINF
	.45	.50	.47	.42	.24	.06	-.16	-.30	-.44	-.53	-.56	WB/UINF
	-.46	-.39	-.47	-.52	-.81	-.63	-.73	-.74	-.81	-.61	-.54	CP
	-.09	-.16	-.03	-.06	-.11	.12	.13	.14	.17	.10	.00	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 35.00 R = 8.04 UINF = 38.7 M/SEC
Z/D = 18.00 PHI = 14.9 DEG

ZB/D \ YB/D		-.49	0.00	.50	.99	1.47	1.97	2.46	2.94	
1.5		1.03	1.07	1.07	1.04	1.06	1.00	1.05	1.01	UM/UINF
		-.07	-.05	.00	.11	.16	.18	.21	.26	VM/UINF
		.04	.09	.09	.06	.03	.01	-.04	-.16	WM/UINF
		-.17	-.25	-.20	-.21	-.27	-.14	-.27	-.13	CP
		-.09	-.10	-.05	-.12	-.12	-.10	-.12	-.01	CPT
1.0		1.07	1.05	1.01	1.10	1.06	1.03	1.05	1.06	UM/UINF
		-.03	-.02	.05	.07	.12	.14	.21	.20	VM/UINF
		.13	.14	.14	.07	.07	.03	-.05	-.07	WM/UINF
		-.23	-.20	-.16	-.32	-.22	-.25	-.26	-.21	CP
		-.05	-.09	-.12	-.09	-.07	-.16	-.10	-.08	CPT
.5		1.04	1.03	1.01	.99	1.07	1.06	1.11	1.05	UM/UINF
		-.12	-.03	.04	.08	.15	.17	.18	.23	VM/UINF
		.19	.19	.19	.20	.10	.00	-.02	-.08	WM/UINF
		-.14	-.19	-.20	-.18	-.25	-.19	-.36	-.29	CP
		-.01	-.10	-.13	-.14	-.06	-.02	-.09	-.14	CPT
0.0		1.05	1.05	1.08	1.10	1.12	1.10	1.16	1.07	UM/UINF
		-.07	-.02	.02	.09	.10	.15	.15	.23	VM/UINF
		.15	.29	.20	.19	.16	.13	.03	-.13	WM/UINF
		-.24	-.22	-.31	-.31	-.37	-.35	-.46	-.29	CP
		-.11	-.03	-.11	-.05	-.08	-.10	-.09	-.06	CPT
-.5		1.02	1.06	1.06	1.05	1.09	1.07	1.02	1.03	UM/UINF
		-.07	-.02	.03	.06	.10	.15	.12	.17	VM/UINF
		.26	.32	.27	.22	.13	.05	.00	-.02	WM/UINF
		-.17	-.22	-.26	-.24	-.21	-.30	-.27	-.32	CP
		-.06	.01	-.06	-.08	.00	-.12	-.21	-.23	CPT
-1.0		1.02	1.04	1.11	1.06	1.01	1.08	1.11	1.11	UM/UINF
		-.04	-.01	.01	.05	.09	.08	.15	.07	VM/UINF
		.26	.29	.33	.28	.17	.03	.08	-.02	WM/UINF
		-.21	-.20	-.33	-.28	-.25	-.21	-.33	-.39	CP
		-.10	-.03	.03	-.07	-.19	-.04	-.06	-.15	CPT
-1.5		1.05	1.05	1.05	1.02	1.09	1.12	1.15	1.11	UM/UINF
		-.01	.01	.07	-.05	-.04	.04	.07	.07	VM/UINF
		.30	.31	.27	.27	.17	.15	.06	-.07	WM/UINF
		-.21	-.22	-.20	-.20	-.30	-.41	-.38	-.37	CP
		.00	-.02	-.02	-.07	-.06	-.13	-.05	-.12	CPT

TABLE C3.- Continued

(d) R = 8. Continued.

X/D = 45.00 R = 8.03 UINF = 39.2
Z/D = 19.50 PHI = 10.7

ZB/D \ YB/D	-1.01	-.51	-.00	.50	1.01	
1.5	1.04	1.01	1.06	1.02	1.05	UB/UINF
	-.10	-.06	-.01	-.02	.06	VB/UINF
	.09	.11	.12	.07	.14	WB/UINF
	-.15	-.14	-.18	-.10	-.18	CP
	-.05	-.10	-.04	-.06	-.04	CPT
1.0	1.01	.99	.98	1.10	1.11	UB/UINF
	-.08	-.08	-.01	.03	.06	VB/UINF
	.08	.19	.13	.22	.13	WB/UINF
	-.07	-.11	-.16	-.30	-.26	CP
	-.03	-.08	-.17	-.04	.00	CPT
.5	.98	.99	.99	1.00	.98	UB/UINF
	-.10	-.09	-.01	.01	.10	VB/UINF
	.16	.18	.22	.23	.21	WB/UINF
	-.09	-.13	-.15	-.11	-.12	CP
	-.09	-.10	-.12	-.05	-.11	CPT
0.0	1.05	.98	1.04	1.03	.99	UB/UINF
	-.08	-.05	-.03	.02	.02	VB/UINF
	.24	.27	.28	.20	.21	WB/UINF
	-.17	-.12	-.15	-.21	-.17	CP
	.01	-.09	.01	-.09	-.13	CPT
-.5	1.01	1.06	1.05	1.08	1.02	UB/UINF
	-.10	-.04	-.02	-.01	.03	VB/UINF
	.26	.26	.28	.27	.26	WB/UINF
	-.14	-.19	-.18	-.21	-.12	CP
	-.03	.00	.00	.05	-.01	CPT
-1.0	1.00	1.00	1.02	1.00	.98	UB/UINF
	-.09	-.04	.01	.05	.02	VB/UINF
	.29	.30	.29	.29	.25	WB/UINF
	-.15	-.07	-.18	-.11	-.12	CP
	-.05	.03	-.04	-.01	-.09	CPT
-1.5	1.00	1.04	1.04	1.10	1.04	UB/UINF
	.01	-.01	-.03	-.06	-.07	VB/UINF
	.22	.28	.27	.30	.23	WB/UINF
	-.22	-.18	-.13	-.19	-.17	CP
	-.16	-.02	.03	.11	-.03	CPT

X/D = 14.00 R = 8.06 UINF = 19.8 M/SEC
Z/D = 15.30 PHI = 20.0 DEG

ZB/D \ YB/D	-.51	-.01	.49	.99	1.49	1.98	2.48	
1.5	.93	.96	1.03	1.14	1.12	.93	.95	UB/UINF
	-.05	.02	.07	.06	.11	.14	.20	VB/UINF
	-.14	-.18	-.19	-.14	-.12	-.22	-.22	WB/UINF
	-.12	-.07	-.07	-.24	-.20	-.02	-.04	CP
	-.23	-.11	.04	.09	.08	-.09	-.04	CPT
1.0	1.08	1.11	1.08	1.06	1.08	1.07	1.03	UB/UINF
	.02	.04	.11	.16	.08	.18	.15	VB/UINF
	-.11	-.06	-.08	-.11	-.07	-.11	-.18	WB/UINF
	-.19	-.22	-.12	-.17	-.20	-.21	-.09	CP
	-.02	.01	.08	.00	-.02	-.03	.03	CPT
.5	1.03	1.07	1.12	1.21	1.14	1.05	1.06	UB/UINF
	-.11	.01	.04	.11	.17	.19	.18	VB/UINF
	-.08	-.05	-.13	-.10	-.08	-.08	-.15	WB/UINF
	-.24	-.23	-.27	-.27	-.28	-.20	-.27	CP
	-.15	-.08	.01	.21	.06	-.05	-.10	CPT
0.0	1.09	1.15	1.17	1.16	1.10	1.16	1.03	UB/UINF
	-.04	-.00	.05	.12	.12	.23	.21	VB/UINF
	.02	-.03	-.06	.02	-.03	-.07	-.16	WB/UINF
	-.36	-.32	-.23	-.40	-.26	-.31	-.23	CP
	-.17	-.00	.15	-.03	-.04	.08	-.10	CPT
-.5	1.09	.95	1.06	.99	1.05	1.13	1.06	UB/UINF
	-.07	-.00	.04	.14	.19	.23	.27	VB/UINF
	.07	.00	.06	.08	.02	-.00	-.17	WB/UINF
	-.41	-.29	-.04	-.31	-.29	-.33	-.21	CP
	-.20	-.38	.10	-.31	-.14	-.00	.02	CPT
-1.0	1.00	1.01	1.06	1.09	1.06	1.18	1.07	UB/UINF
	-.07	.03	.07	.18	.24	.14	.28	VB/UINF
	.18	.11	.02	.01	-.10	.05	-.17	WB/UINF
	-.33	-.36	-.32	-.36	-.36	-.41	-.40	CP
	-.29	-.30	-.19	-.15	-.15	-.20	-.15	CPT
-1.5	1.09	.80	.77	1.11	.99	.99	1.21	UB/UINF
	-.10	-.14	.13	.18	.27	.24	.33	VB/UINF
	.10	.27	.19	.14	.07	.00	-.16	WB/UINF
	-.44	-.19	-.19	-.46	-.44	-.35	-.44	CP
	-.22	-.46	-.55	-.16	-.39	-.31	.16	CPT

TABLE C3.- Continued

(d) R = 8. Concluded.

X/D = 2.00 R = 10.02 UINF = 24.6 M/SEC
Z/D = 6.00 PHI = 52.0 DEG

ZB/D \ YB/D	0.00	.50	.76	1.02	1.27	1.52	1.77	2.03	2.53	
1.5	4.53	4.88	4.50	3.79	3.18	1.81	1.28	.77	.51	UB/UINF
	.05	.57	.65	.89	.98	1.02	.79	.80	.39	VB/UINF
	1.44	1.33	1.32	.87	.40	-.18	-.58	-1.02	-1.09	WB/UINF
	-8.32	-9.58	-8.67	-7.07	-7.12	-4.10	-3.73	-1.87	-.91	CP
	13.98	16.28	13.44	8.21	3.29	-.76	-2.12	-.60	-.30	CPT
1.0	2.62	3.00	4.29	3.87	3.79	2.95	1.81	1.24	.58	UB/UINF
	.13	.46	.59	.74	.87	1.09	.98	.71	.29	VB/UINF
	.79	.75	.78	.76	.54	.33	-.31	-.73	-1.21	WB/UINF
	-6.17	-6.46	-8.38	-7.12	-7.32	-6.10	-4.52	-4.06	-1.57	CP
	.42	2.47	10.49	8.37	7.46	3.06	-1.15	-2.48	-.68	CPT
.5	1.37	1.71	2.87	3.37	3.23	3.23	2.15	1.69	.91	UB/UINF
	-.11	.34	.31	.51	.68	.81	.94	.72	.36	VB/UINF
	1.08	1.04	.57	.27	.01	-.11	-.63	-1.12	-1.46	WB/UINF
	-4.50	-4.91	-6.76	-7.08	-6.58	-6.42	-4.70	-4.16	-1.92	CP
	-2.44	-1.76	1.01	3.77	3.50	3.87	.25	-.50	.17	CPT
0.0	.97	2.03	2.07	2.77	2.82	3.01	2.73	1.88	1.08	UB/UINF
	-.33	-.45	-.37	-.26	.15	.15	.35	.09	.08	VB/UINF
	1.53	1.07	.60	.10	-.40	-.45	-.54	-.99	-1.21	WB/UINF
	-3.49	-6.06	-6.08	-5.75	-6.27	-7.05	-6.80	-4.79	-2.88	CP
	-1.08	-1.55	-2.27	1.10	.94	1.35	.14	-1.25	-1.23	CPT
-.5	.77	1.32	1.81	2.17	2.08	2.10	2.25	1.37	.87	UB/UINF
	-.45	-.96	-1.14	-.87	-.58	-.46	-.45	-.33	-.55	VB/UINF
	1.34	.97	.78	.04	-.32	-.74	-.89	-1.19	-1.22	WB/UINF
	-1.59	-3.56	-3.76	-5.82	-5.22	-5.11	-5.08	-3.27	-1.80	CP
	.03	-.94	.45	-1.34	-1.41	-.88	.03	-.85	-.23	CPT
-1.0	.87	.86	1.11	1.39	1.45	1.49	1.29	.98	.76	UB/UINF
	-.07	-.74	-.82	-.87	-.87	-.91	-.85	-.84	-.62	VB/UINF
	.73	.66	.61	.08	-.27	-.61	-.66	-.92	-1.16	WB/UINF
	-1.23	-.60	-1.14	-2.11	-2.32	-2.29	-2.36	-1.52	-1.07	CP
	-.94	.13	.14	-.39	-.37	.13	-.53	-.00	.24	CPT
-1.5	.55	.85	.77	.84	.99	.96	1.01	.88	.78	UB/UINF
	.00	-.37	-.55	-.66	-.64	-.69	-.68	-.66	-.72	VB/UINF
	.57	.18	.14	-.01	-.24	-.51	-.63	-.77	-.80	WB/UINF
	-.19	-.23	-.04	-.19	-.71	-.50	-.75	-.73	-.62	CP
	-.56	-.34	-.12	-.04	-.27	.17	.14	.08	.15	CPT

TABLE C3.- Continued

(e) R = 10.

X/D = 1.82 R = 10.06 UINF = 24.6 M/SEC
Z/D = 7.70 PHI = 52.0 DEG

ZB/D \ YB/D		0.00	.50	.76	1.02	1.27	1.52	1.77	2.03	2.53
1.5	UB/UINF	2.52	1.73	1.35	1.16	.84	.57	.38	.48	.39
	VB/UINF	.11	.61	.71	.76	.77	.77	.50	.56	.48
	WB/UINF	.90	.88	.36	.29	-.11	-.58	-.91	-.70	-.86
	CP	-2.86	-1.22	-2.02	-1.50	-1.39	-.62	-.11	-.60	-.01
	CPT	3.39	1.93	-.55	-.62	-1.09	-.36	.10	-.56	.11
1.0	UB/UINF	3.56	3.30	3.08	2.67	1.83	1.31	.88	.76	.57
	VB/UINF	.12	.59	.71	.83	1.04	.95	1.11	.66	.33
	WB/UINF	1.17	.96	.86	.41	.23	-.21	-.39	-.58	-.92
	CP	-3.82	-3.80	-3.21	-3.63	-2.75	-2.22	-1.29	-1.88	-.92
	CPT	9.50	7.54	6.70	3.47	.78	-.56	-.13	-1.52	-.63
.5	UB/UINF	3.35	3.49	3.68	3.59	2.98	2.50	1.78	1.13	.94
	VB/UINF	.10	.45	.68	.87	.88	1.06	.81	.83	.50
	WB/UINF	.84	.86	.70	.49	.38	.12	-.11	-.53	-.92
	CP	-4.66	-3.97	-5.58	-5.75	-4.78	-3.33	-3.83	-2.79	-2.37
	CPT	6.45	8.41	8.19	7.40	4.15	3.13	-.96	-1.54	-1.38
0.0	UB/UINF	1.90	2.63	2.76	3.50	3.11	2.97	1.97	2.01	.94
	VB/UINF	.21	.54	.63	.75	.78	.98	.92	.71	.46
	WB/UINF	.70	.50	.46	.39	.30	.10	-.03	-.62	-1.13
	CP	-3.54	-4.53	-4.49	-5.58	-4.92	-5.15	-3.82	-4.39	-2.51
	CPT	-.36	1.97	2.84	6.64	4.63	3.75	-.08	-.44	-1.12
-.5	UB/UINF	1.51	1.49	2.25	2.60	2.90	2.89	1.77	2.37	1.25
	VB/UINF	-.13	.33	.50	.70	.58	.70	1.32	.69	.33
	WB/UINF	.99	.90	.57	.17	.02	-.29	-.31	-.50	-1.20
	CP	-3.28	-3.49	-4.26	-4.98	-5.42	-5.60	-3.23	-5.04	-3.54
	CPT	-.49	-1.31	.39	1.34	2.43	2.46	.77	.36	-1.43
-1.0	UB/UINF	1.36	1.53	2.24	2.52	1.91	2.54	2.38	1.68	.96
	VB/UINF	-.07	-.40	-.24	.08	.32	.32	.56	.60	-.02
	WB/UINF	1.20	.97	.31	.13	-.02	-.43	-.67	-1.05	-1.26
	CP	-3.27	-3.77	-4.50	-4.49	-3.95	-5.20	-4.35	-3.45	-3.01
	CPT	-.96	-1.30	-.30	.94	-1.17	.60	1.11	-.12	-1.51
-1.5	UB/UINF	1.10	1.38	2.03	2.10	2.57	1.92	1.78	1.18	1.09
	VB/UINF	-.30	-.92	-.71	-.43	-.34	-.08	-.19	.27	-.06
	WB/UINF	1.19	.68	.50	.34	-.36	-.60	-.88	-1.46	-1.42
	CP	-2.17	-2.50	-4.12	-4.19	-5.39	-4.23	-3.98	-1.92	-2.36
	CPT	-.43	-.30	-.21	-.45	.53	-1.16	-1.01	.69	-.13

TABLE C3.- Continued

(e) R = 10. Continued.

X/D = 2.03 R = 10.01 UINF = 30.8 M/SEC
Z/D = 6.00 PHI = 51.9 DEG

ZB/D \ YB/D	0.00	.51	.75	1.01	1.26	1.52	1.77	2.01	2.52	
1.5	4.58	4.52	4.39	3.97	2.82	2.03	.94	.94	.55	UB/UINF
	.12	.48	.67	.87	.90	.90	.95	.69	.32	VB/UINF
	1.30	1.29	1.21	.84	.40	-.18	-.75	-.83	-1.06	WB/UINF
	-8.84	-8.08	-7.40	-7.34	-5.32	-4.69	-2.25	-2.55	-1.28	CP
	14.07	14.37	13.79	9.56	2.80	-.68	-.90	-1.48	-.73	CPT
1.0	2.30	3.60	3.54	3.82	3.61	3.15	2.24	1.48	.61	UB/UINF
	.11	.36	.52	.84	.91	.91	.78	.79	.48	VB/UINF
	.76	.70	.75	.59	.34	.22	-.27	-.74	-1.26	WB/UINF
	-5.53	-7.06	-7.28	-6.63	-6.63	-5.82	-5.51	-3.91	-1.25	CP
	-.58	5.97	5.49	8.55	6.76	4.22	-.75	-1.53	-.05	CPT
.5	1.03	1.93	2.28	3.25	3.32	3.06	2.59	1.99	1.05	UB/UINF
	-.25	.15	.40	.53	.59	.72	.58	.46	.19	VB/UINF
	1.33	.87	.65	.22	.09	-.23	-.60	-.81	-1.17	WB/UINF
	-3.52	-5.53	-6.07	-6.26	-6.96	-6.06	-6.21	-4.98	-3.00	CP
	-1.60	-1.97	-1.21	3.87	3.68	3.08	.32	-1.10	-1.49	CPT
0.0	.82	1.87	2.38	2.72	3.16	2.87	2.47	1.91	.99	UB/UINF
	-.31	-.48	-.28	-.15	.24	.32	.22	.27	.10	VB/UINF
	1.63	1.27	.76	.39	-.25	-.45	-.75	-1.03	-1.36	WB/UINF
	-3.30	-5.31	-5.40	-6.26	-6.27	-6.11	-6.14	-4.90	-2.55	CP
	-.85	-.91	.04	.46	3.07	1.60	-.33	-1.07	-.70	CPT
-.5	.76	1.36	2.03	2.41	2.42	2.21	1.72	1.48	.96	UB/UINF
	-.24	-.74	-1.01	-.82	-.61	-.36	-.23	-.27	-.37	VB/UINF
	1.45	1.22	.66	.25	-.25	-.60	-1.01	-1.12	-1.26	WB/UINF
	-2.09	-3.25	-4.36	-5.12	-4.96	-5.22	-4.46	-3.86	-2.26	CP
	-.32	-.32	.29	.53	.41	-.78	-1.38	-1.30	-.59	CPT
-1.0	.67	.84	1.24	1.29	1.47	1.50	1.48	.97	.79	UB/UINF
	.09	-.76	-.90	-.95	-.89	-.85	-.61	-.63	-.58	VB/UINF
	.94	.81	.53	.38	-.26	-.55	-.75	-1.10	-1.10	WB/UINF
	-.87	-.76	-1.51	-1.91	-2.74	-2.91	-3.14	-1.98	-1.44	CP
	-.53	.18	.11	-.19	-.70	-.61	-1.00	-.41	-.28	CPT
-1.5	.87	.82	.90	.94	.87	.99	.87	.93	.82	UB/UINF
	.09	-.43	-.52	-.70	-.78	-.86	-.71	-.68	-.57	VB/UINF
	.40	.24	.21	.08	-.24	-.45	-.72	-.73	-.91	WB/UINF
	-.47	-.25	-.31	-.34	-.56	-.81	-.76	-1.00	-.85	CP
	-.55	-.34	-.18	.04	-.14	.13	.03	-.12	-.02	CPT

TABLE C3.- Continued

(e) R = 10. Continued.

X/D = 2.01 R = 10.04 UINF = 30.8
Z/D = 7.75 PHI = 51.9

ZB/D \ YB/D	0.00	.51	.75	
1.5	2.97	2.35	2.11	UB/UINF
	.17	.57	.73	VB/UINF
	.93	.68	.45	WB/UINF
	-3.27	-2.50	-2.76	CP
	5.63	2.90	1.52	CPT
1.0	3.61	3.38	3.10	UB/UINF
	.04	.58	.71	VB/UINF
	.99	.86	.67	WB/UINF
	-4.04	-3.62	-3.68	CP
	9.39	8.23	6.13	CPT
.5	2.64	3.56	3.22	UB/UINF
	-.06	.48	.73	VB/UINF
	.65	.61	.61	WB/UINF
	-3.72	-5.10	-4.09	CP
	2.80	7.55	6.50	CPT
0.0	1.67	2.21	2.74	UB/UINF
	.01	.39	.59	VB/UINF
	.75	.54	.35	WB/UINF
	-3.29	-4.03	-4.96	CP
	-.93	.34	2.17	CPT
-.5	1.19	2.01	2.21	UB/UINF
	-.09	.12	.38	VB/UINF
	1.25	.82	.57	WB/UINF
	-2.94	-4.05	-4.12	CP
	-.94	-.26	.29	CPT
-1.0	1.02	2.17	2.55	UB/UINF
	-.27	-.13	-.12	VB/UINF
	1.33	.85	.44	WB/UINF
	-2.46	-4.51	-5.32	CP
	-.56	.02	.52	CPT
-1.5	1.10	1.64	2.23	UB/UINF
	.06	-.67	-.50	VB/UINF
	1.22	.80	.61	WB/UINF
	-2.33	-3.17	-3.68	CP
	-.60	-.37	.99	CPT

X/D = 6.00 R = 10.02 UINF = 30.8 M/SEC
Z/D = 9.98 PHI = 34.8 DEG

ZB/D \ YB/D	.00	.50	.98	1.49	1.98	2.47	
1.5	1.19	1.54	1.51	2.00	2.05	1.85	UB/UINF
	.09	.32	.33	.56	.61	.70	VB/UINF
	.73	.49	.50	.21	-.15	-.32	WB/UINF
	-1.28	-1.86	-1.55	-2.11	-2.04	-1.98	CP
	-.32	-.13	.12	1.33	1.61	1.08	CPT
1.0	1.22	1.19	1.81	2.10	1.94	1.91	UB/UINF
	-.05	.23	.30	.55	.64	.57	VB/UINF
	.84	.89	.46	.12	-.12	-.43	WB/UINF
	-1.76	-1.57	-2.26	-2.67	-2.09	-2.18	CP
	-.56	-.31	.33	1.10	1.15	.99	CPT
.5	1.05	1.19	1.73	2.04	2.15	1.67	UB/UINF
	-.12	-.02	.14	.33	.36	.50	VB/UINF
	1.05	.86	.52	.19	-.17	-.56	WB/UINF
	-1.60	-1.84	-2.43	-2.50	-2.50	-1.97	CP
	-.36	-.69	-.11	.86	1.34	.39	CPT
0.0	1.03	1.17	1.85	2.04	2.08	1.70	UB/UINF
	-.11	-.32	-.14	.06	.23	.31	VB/UINF
	1.07	.93	.46	.20	-.27	-.65	WB/UINF
	-1.60	-1.56	-2.73	-2.72	-2.96	-2.07	CP
	-.36	-.22	-.05	.53	.55	.37	CPT
-.5	.99	1.25	1.46	1.72	1.86	1.74	UB/UINF
	-.25	-.26	-.43	-.15	.09	-.04	VB/UINF
	.97	.75	.47	.17	-.34	-.66	WB/UINF
	-1.42	-2.02	-2.40	-2.58	-2.71	-2.96	CP
	-.43	-.80	-.84	-.54	-.08	-.48	CPT
-1.0	.96	1.19	1.28	1.43	1.63	1.54	UB/UINF
	-.08	-.39	-.54	-.53	-.45	-.39	VB/UINF
	.87	.61	.53	.08	-.12	-.57	WB/UINF
	-.86	-1.36	-1.67	-1.96	-2.69	-2.24	CP
	-.18	-.41	-.45	-.63	-.79	-.37	CPT
-1.5	.94	1.04	1.06	1.29	1.40	1.32	UB/UINF
	.00	-.26	-.58	-.61	-.57	-.50	VB/UINF
	.61	.49	.35	.06	-.30	-.60	WB/UINF
	-.62	-.75	-.82	-1.47	-1.71	-1.74	CP
	-.35	-.35	-.23	-.43	-.34	-.37	CPT

TABLE C3.- Concluded

(e) R = 10. Concluded.

X/D = 4.00 R = 3.98 UINF = 39.6 M/SEC
Z/D = 1.75 PHI = .8 DEG

ZB/D \ YB/D	-2.52	-1.02	-.50	0.00	.52	1.01	1.52	2.02	2.53	
1.5	1.06	.82	.37	.30	.35	.60	1.10	1.22	1.08	UB/UINF
	.06	.12	.19	.13	-.13	-.06	-.02	.06	.02	VB/UINF
	-.24	.28	.54	.62	.59	.18	.09	-.05	-.26	WB/UINF
	-.18	-.78	-.62	-.76	-.65	-.96	-.86	-.64	-.27	CP
	.01	-1.02	-1.16	-1.27	-1.16	-1.57	-.63	-.14	-.03	CPT
1.0	1.07	.93	.56	.30	.50	.75	1.04	1.11	1.11	UB/UINF
	.15	.24	.22	.09	-.10	-.22	-.14	-.09	-.11	VB/UINF
	-.20	.33	.54	.72	.48	.39	.06	-.11	-.23	WB/UINF
	-.24	-.87	-.90	-.61	-1.00	-.83	-.82	-.59	-.28	CP
	-.04	-.84	-1.25	-1.00	-1.51	-1.06	-.71	-.33	.02	CPT
.5	1.05	.95	.74	.40	.63	.88	1.01	1.13	1.09	UB/UINF
	.21	.37	.20	.07	-.15	-.29	-.31	-.24	-.20	VB/UINF
	-.16	.33	.46	.65	.51	.31	.03	-.15	-.19	WB/UINF
	-.19	-.54	-.81	-.58	-.87	-.71	-.59	-.42	-.24	CP
	-.01	-.37	-1.01	-.99	-1.19	-.75	-.47	-.06	.04	CPT
0.0	1.05	.90	.75	.41	.62	.90	1.05	1.06	1.09	UB/UINF
	.23	.43	.36	.05	-.33	-.31	-.35	-.29	-.23	VB/UINF
	-.09	.23	.39	.61	.49	.29	.03	-.11	-.12	WB/UINF
	-.17	-.31	-.48	-.49	-.48	-.35	-.36	-.22	-.22	CP
	-.01	-.26	-.63	-.95	-.74	-.36	-.14	.01	.05	CPT
-.5	1.00	.96	.64	.55	.75	.89	1.01	1.05	1.06	UB/UINF
	.22	.32	.26	.01	-.16	-.28	-.35	-.27	-.22	VB/UINF
	-.05	.16	.27	.37	.22	.18	.04	-.06	-.04	WB/UINF
	-.06	-.20	-.46	-.58	-.55	-.20	-.16	-.14	-.13	CP
	-.01	-.14	-.91	-1.14	-.92	-.29	-.01	.03	.04	CPT
-1.0	1.03	.95	.71	.41	.90	.93	1.05	.98	1.00	UB/UINF
	.19	.25	.16	.05	-.11	-.28	-.25	-.24	-.20	VB/UINF
	-.03	.04	.22	.09	.11	.05	.04	.02	-.00	WB/UINF
	-.12	-.21	-.34	-.57	-.54	-.20	-.15	-.07	-.06	CP
	-.01	-.24	-.76	-1.39	-.70	-.26	.02	-.05	-.01	CPT
-1.5	.97	.91	.65	.39	.79	.91	.94	1.01	1.02	UB/UINF
	.20	.20	.16	.07	-.15	-.17	-.22	-.19	-.16	VB/UINF
	-.01	-.04	-.04	.07	-.12	.01	-.00	.05	-.01	WB/UINF
	-.03	-.26	-.47	-.55	-.46	-.23	-.13	-.16	-.11	CP
	-.04	-.38	-1.02	-1.39	-.79	-.37	-.19	-.11	-.04	CPT

TABLE C4.- VERTICAL SECTION VELOCITIES AND PRESSURES

(a) R = 4.

X/D = 6.00 R = 3.99 UINF = 38.9 M/SEC PINF = .102E+06 N/M**2
Z/D = 1.75 PHI = .7 DEG Q = .955E+03 N/M**2

ZB/D \ YB/D	-1.13	-.62	-.10	.41	.93	
1.5	.78	.61	.61	.68	.71	UB/UINF
	.19	.25	.06	-.02	-.10	VB/UINF
	.28	.46	.44	.45	.35	WB/UINF
	-.29	-.23	-.54	-.57	-.47	CP
	-.57	-.59	-.97	-.90	-.83	CPT
1.0	1.09	.84	.63	.64	.77	UB/UINF
	.21	.22	.17	-.01	-.17	VB/UINF
	.20	.34	.45	.31	.37	WB/UINF
	-.44	-.45	-.44	-.56	-.39	CP
	-.15	-.58	-.82	-1.06	-.62	CPT
.5	.94	.85	.64	.71	.91	UB/UINF
	.25	.22	.09	-.12	-.20	VB/UINF
	.19	.29	.33	.28	.25	WB/UINF
	-.23	-.36	-.50	-.45	-.39	CP
	-.26	-.50	-.97	-.85	-.47	CPT
0.0	.95	.91	.56	.63	.93	UB/UINF
	.25	.17	.04	-.09	-.13	VB/UINF
	.14	.24	.29	.14	.17	WB/UINF
	-.18	-.27	-.39	-.43	-.32	CP
	-.18	-.36	-.98	-1.01	-.40	CPT
-.5	.91	.90	.66	.59	.92	UB/UINF
	.18	.15	.08	-.12	-.15	VB/UINF
	.07	.10	.10	.21	.09	WB/UINF
	-.14	-.33	-.45	-.37	-.17	CP
	-.29	-.47	-.99	-.97	-.30	CPT
-1.0	.94	.94	.77	.79	.94	UB/UINF
	.16	.13	.03	-.07	-.08	VB/UINF
	.03	.01	.12	.06	.02	WB/UINF
	-.14	-.33	-.49	-.35	-.27	CP
	-.23	-.42	-.88	-.72	-.38	CPT
-1.5	.95	.85	.73	.64	.86	UB/UINF
	.11	.11	.09	-.01	-.11	VB/UINF
	-.03	.01	-.01	-.00	-.04	WB/UINF
	-.17	-.27	-.40	-.35	-.23	CP
	-.25	-.53	-.86	-.94	-.48	CPT

TABLE C4.- Continued

(a) R = 4. Continued.

X/D = 8.00　　R = 3.99　　UINF = 38.9 M/SEC
Z/D = 1.75　　　　　　　　PHI = .7 DEG

ZB/D \ YB/D	-3.00	-2.50	-1.00	-.50	0.00	.50	1.00	1.50	2.00	2.50	3.00	
	.98	1.00	.98	.80	.71	.60	.80	.86	1.01	.96	.95	UB/UINF
	.14	.18	.20	.16	.07	-.11	-.14	-.16	-.10	-.11	-.09	VB/UINF
1.5	-.12	-.12	.22	.26	.31	.35	.24	.16	.01	-.12	-.15	WB/UINF
	-.01	-.07	-.31	-.39	-.37	-.19	-.24	-.18	-.23	-.11	-.00	CP
	-.01	-.02	-.25	-.66	-.76	-.70	-.52	-.39	-.20	-.11	-.06	CPT
	1.01	1.01	.91	.86	.71	.78	.85	.97	.99	1.02	1.01	UB/UINF
	.12	.16	.17	.15	.03	-.03	-.13	-.16	-.18	-.16	-.11	VB/UINF
1.0	-.09	-.07	.16	.15	.26	.20	.18	.14	.01	-.08	-.11	WB/UINF
	-.06	-.09	-.23	-.45	-.34	-.40	-.31	-.20	-.16	-.11	-.06	CP
	-.01	-.04	-.35	-.67	-.78	-.75	-.53	-.20	-.14	-.04	-.02	CPT
	1.00	1.00	.95	.93	.77	.87	.81	1.01	1.01	.99	1.02	UB/UINF
	.13	.17	.16	.12	.03	-.01	-.17	-.16	-.15	-.15	-.14	VB/UINF
.5	-.05	-.04	.06	.11	.11	.12	.16	.10	-.01	-.06	-.06	WB/UINF
	-.03	-.06	-.27	-.36	-.49	-.43	-.15	-.16	-.12	-.06	-.06	CP
	-.00	-.02	-.34	-.47	-.89	-.66	-.43	-.10	-.08	-.04	.01	CPT
	1.00	.98	.99	.77	.75	.70	.81	.96	1.01	.98	1.00	UB/UINF
	.14	.15	.12	.11	.05	-.04	-.07	-.10	-.14	-.13	-.10	VB/UINF
0.0	-.03	-.01	.04	.18	.09	.17	.12	.06	.02	-.00	-.03	WB/UINF
	-.03	-.01	-.25	-.29	-.38	-.29	-.21	-.15	-.08	-.00	-.04	CP
	.00	-.01	-.28	-.64	-.80	-.77	-.53	-.21	-.04	-.02	-.02	CPT
	1.00	1.00	.98	.78	.84	.85	.89	.96	.99	1.00	1.00	UB/UINF
	.11	.15	.13	.06	.05	.00	-.08	-.09	-.13	-.10	-.08	VB/UINF
-.5	-.01	-.01	.05	.06	.08	.06	.05	.01	.01	-.00	-.02	WB/UINF
	-.02	-.04	-.19	-.28	-.34	-.27	-.20	-.10	-.06	-.04	-.01	CP
	-.00	-.02	-.21	-.66	-.62	-.54	-.39	-.17	-.06	-.01	-.01	CPT
	1.00	.99	.80	.91	.82	.88	.86	.94	.99	1.00	.98	UB/UINF
	.13	.14	.14	.06	.02	-.03	-.07	-.12	-.11	-.10	-.08	VB/UINF
-1.0	.00	-.00	-.01	.02	-.02	.00	-.07	-.04	.00	-.01	-.00	WB/UINF
	-.02	-.02	-.08	-.28	-.34	-.32	-.21	-.09	-.05	-.04	.00	CP
	.01	-.01	-.42	-.45	-.67	-.54	-.46	-.18	-.06	-.02	-.02	CPT
	.94	.95	.90	.87	.76	.74	.83	.95	.91	1.00	.97	UB/UINF
	.09	.11	.11	.14	.02	-.01	-.05	-.05	-.06	-.05	-.05	VB/UINF
-1.5	.01	.00	-.04	-.03	-.04	-.04	-.03	-.02	-.02	-.00	-.00	WB/UINF
	.02	-.04	-.19	-.30	-.31	-.26	-.17	-.14	-.04	-.05	-.03	CP
	-.08	-.13	-.37	-.52	-.72	-.71	-.48	-.24	-.21	-.05	-.08	CPT

TABLE C4.- Continued

(a) R = 4. Concluded.

X/D = 4.00 R = 8.03 UINF = 38.8 M/SEC
Z/D = 1.75 PHI = .8 DEG

ZB/D \ YB/D	-3.53	-2.52	-1.01	-.50	0.00	.51	1.01	1.50	2.02	2.53	3.54	
	1.04	1.01	.78	.71	.51	.75	.72	.85	.92	1.00	1.05	UB/UINF
	.32	.41	.34	.21	-.06	-.18	-.32	-.38	-.38	-.35	-.27	VB/UINF
1.5	-.01	.09	.35	.45	.49	.43	.39	.27	.16	.07	-.02	WB/UINF
	-.13	-.08	.25	.19	.05	.04	.33	.20	.08	-.04	-.09	CP
	.05	.11	.10	-.05	-.44	-.18	.10	.14	.10	.10	.10	CPT
	1.04	1.03	.88	.75	.60	.74	.84	.91	1.01	1.05	1.08	UB/UINF
	.29	.34	.27	.18	.02	-.15	-.22	-.29	-.31	-.31	-.26	VB/UINF
1.0	.01	.09	.27	.34	.40	.33	.29	.23	.14	.08	-.01	WB/UINF
	-.14	-.11	.16	.17	-.07	-.02	.17	.12	-.02	-.09	-.15	CP
	.04	.06	.08	-.12	-.56	-.35	.01	.09	.12	.12	.10	CPT
	1.04	1.03	.90	.87	.61	.81	.89	.94	1.00	1.03	1.06	UB/UINF
	.27	.32	.24	.12	.05	-.10	-.20	-.27	-.28	-.27	-.23	VB/UINF
.5	.02	.08	.20	.27	.33	.26	.25	.19	.14	.09	.03	WB/UINF
	-.12	-.07	.14	.07	-.01	-.05	.12	.11	.01	-.05	-.10	CP
	.04	.10	.05	-.07	-.52	-.32	.02	.10	.11	.10	.08	CPT
	1.04	1.00	.92	.70	.65	.83	.96	.95	1.01	1.04	1.05	UB/UINF
	.23	.28	.21	.20	.01	-.10	-.14	-.18	-.23	-.23	-.21	VB/UINF
0.0	.03	.07	.18	.22	.25	.18	.16	.15	.12	.07	.02	WB/UINF
	-.10	-.05	.10	.13	-.05	-.09	.06	.10	.04	-.05	-.11	CP
	.04	.02	.02	-.29	-.57	-.36	.02	.07	.13	.10	.04	CPT
	1.04	1.01	.92	.80	.69	.73	.93	.98	1.02	1.03	1.05	UB/UINF
	.22	.23	.19	.19	.02	-.10	-.14	-.16	-.20	-.21	-.19	VB/UINF
-.5	.02	.05	.12	.12	.12	.13	.09	.10	.09	.07	.03	WB/UINF
	-.10	-.03	.04	.04	-.09	-.07	.01	.06	.00	-.02	-.08	CP
	.03	.04	-.05	-.26	-.59	-.51	-.10	.05	.09	.09	.06	CPT
	1.03	1.04	.95	.88	.70	.80	.88	.97	1.00	1.01	1.04	UB/UINF
	.23	.23	.20	.14	.02	-.06	-.12	-.16	-.17	-.17	-.17	VB/UINF
-1.0	.00	.04	.04	.04	.02	.03	.03	.05	.06	.04	.01	WB/UINF
	-.09	-.07	-.03	-.09	-.07	-.12	-.01	.00	.00	-.01	-.06	CP
	.03	.06	-.08	-.28	-.57	-.47	-.21	-.02	.04	.05	.05	CPT
	1.02	.98	.80	.71	.60	.64	.81	.83	.98	1.01	1.02	UB/UINF
	.20	.20	.10	.03	.06	-.08	-.10	-.11	-.14	-.15	-.18	VB/UINF
-1.5	-.00	.01	-.02	-.07	-.06	-.06	-.03	.01	.01	.01	.01	WB/UINF
	-.06	.01	-.05	-.06	-.09	-.07	-.08	.00	-.03	-.03	-.04	CP
	.03	.02	-.39	-.54	-.71	-.65	-.41	-.29	-.05	.02	.03	CPT

TABLE C4.- Continued

(b) R = 8.

X/D = 6.00   R = 8.03   UINF = 38.8 M/SEC
Z/D = 1.75   PHI = .7 DEG

ZB/D \ YB/D	-5.23	-2.66	-1.13	-.61	-.10	.43	.93	1.45	1.97	2.48	3.00	3.51	5.06	
1.5	1.01	.97	.80	.86	.63	.71	.85	.89	.94	.95	1.00	.98	1.01	UB/UINF
	.20	.28	.23	.12	.03	-.10	-.14	-.17	-.20	-.20	-.23	-.21	-.16	VB/UINF
	-.03	.08	.22	.23	.27	.30	.24	.19	.13	.08	.05	.02	-.02	WB/UINF
	-.05	-.03	.19	.08	.07	.12	.19	.17	.08	.06	-.01	.01	-.02	CP
	.01	.01	-.07	-.10	-.45	-.28	-.00	.03	.03	.01	.05	.02	.02	CPT
1.0	1.03	.96	.89	.86	.83	.83	.88	.93	.96	1.01	1.02	.98	1.05	UB/UINF
	.17	.24	.15	.09	.06	-.05	-.11	-.14	-.19	-.19	-.21	-.20	-.17	VB/UINF
	.01	.09	.15	.20	.18	.22	.20	.16	.13	.09	.07	.05	-.00	WB/UINF
	-.09	-.01	.05	.04	-.08	-.03	.08	.09	.07	-.03	-.05	-.04	-.10	CP
	.01	-.01	-.11	-.16	-.36	-.30	-.10	.01	.04	.03	.05	-.02	.02	CPT
.5	1.03	.99	.91	.97	.82	.91	.92	.95	.96	.99	.98	1.01	1.03	UB/UINF
	.19	.21	.14	.09	.07	-.07	-.11	-.12	-.14	-.17	-.19	-.18	-.15	VB/UINF
	.00	.08	.13	.13	.14	.12	.14	.14	.09	.06	.05	.03	.00	WB/UINF
	-.09	-.02	.06	-.06	-.09	-.06	.02	.05	.01	-.02	-.02	-.05	-.09	CP
	.01	.00	-.07	-.09	-.39	-.21	-.11	-.01	-.03	-.01	-.02	.00	.00	CPT
0.0	1.03	.99	.94	.86	.82	.79	.85	.97	.95	.99	1.00	.99	1.04	UB/UINF
	.21	.22	.16	.10	.04	-.03	-.11	-.10	-.14	-.15	-.18	-.17	-.15	VB/UINF
	.01	.07	.09	.09	.14	.11	.11	.10	.08	.06	.05	.04	.00	WB/UINF
	-.10	-.04	.00	-.01	-.10	-.08	-.00	.01	.03	-.02	-.03	-.01	-.10	CP
	.00	-.01	-.08	-.25	-.40	-.45	-.25	-.02	-.03	-.01	-.00	.00	.01	CPT
-.5	1.03	.99	.91	.89	.80	.85	.85	.94	.99	.99	.99	1.01	1.05	UB/UINF
	.22	.18	.13	.10	.06	-.04	-.05	-.12	-.11	-.14	-.16	-.15	-.14	VB/UINF
	-.01	.05	.04	.01	.08	.03	.05	.06	.07	[illegible]	.05	.02	.01	WB/UINF
	-.11	-.03	-.00	-.04	-.07	-.04	-.03	.01	-.02	-.01	-.01	-.02	-.10	CP
	-.00	-.01	-.15	-.23	-.41	-.31	-.29	-.08	-.02	-.01	.01	.02	.02	CPT
-1.0	1.04	.99	.90	.92	.85	.84	.88	.92	.96	.98	1.02	1.01	1.04	UB/UINF
	.21	.20	.17	.09	.02	-.05	-.07	-.11	-.08	-.15	-.12	-.13	-.12	VB/UINF
	-.05	.04	.00	.01	.01	-.02	-.01	.01	.03	.03	.02	.01	-.02	WB/UINF
	-.13	-.02	-.07	-.09	-.08	-.05	-.06	-.02	-.03	-.03	-.06	-.04	-.08	CP
	-.00	.00	-.23	-.23	-.37	-.34	-.27	-.16	-.09	-.05	-.01	.01	.01	CPT
-1.5	1.02	.99	.86	.65	.72	.74	.76	.86	.85	.93	.98	1.02	1.04	UB/UINF
	.11	.16	.08	.11	.04	-.01	-.05	-.05	-.07	-.09	-.11	-.12	-.12	VB/UINF
	-.11	.01	-.03	-.02	-.05	-.02	-.04	-.04	-.02	.00	.00	.00	-.03	WB/UINF
	-.11	-.05	-.08	-.02	-.03	-.10	-.07	-.06	-.04	-.04	-.01	-.07	-.10	CP
	-.04	-.04	-.32	-.59	-.51	-.54	-.48	-.32	-.32	-.17	-.03	-.01	-.00	CPT

TABLE C4.- Continued

(b) R = 8. Continued.

X/D = 8.00 R = 8.03 UINF = 38.8 M/SEC
Z/D = 1.75 PHI = .7 DEG

ZB/D \ YB/D	-3.99	-2.50	-1.00	-.51	0.00	.50	1.00	1.50	2.00	2.50	3.00	4.00	
1.5	.99	.95	.93	.79	.80	.91	.90	.94	.94	.94	.96	.97	UB/UINF
	.21	.20	.12	.09	.01	-.03	-.09	-.09	-.13	-.14	-.16	-.15	VB/UINF
	.03	.08	.15	.13	.20	.16	.13	.13	.10	.07	.05	.02	WB/UINF
	-.00	.07	.05	.06	.02	-.02	.10	.08	.09	.10	.07	.03	CP
	.02	.03	-.04	-.28	-.29	-.17	-.07	.00	.00	.01	.02	-.01	CPT
1.0	1.00	.98	.93	.95	.88	.88	.87	.95	.97	.99	.98	1.00	UB/UINF
	.19	.16	.10	.06	.05	-.04	-.09	-.09	-.12	-.13	-.14	-.13	VB/UINF
	.02	.08	.12	.14	.13	.12	.11	.10	.09	.07	.06	.03	WB/UINF
	-.04	.01	.03	-.06	-.06	-.07	.02	.06	.04	.01	.02	-.03	CP
	.01	.01	-.08	-.13	-.26	-.27	-.20	-.01	-.00	.01	.01	-.00	CPT
.5	1.01	.98	.93	.83	.85	.89	.90	.93	.95	.98	1.00	1.01	UB/UINF
	.18	.18	.09	.09	.01	.01	-.06	-.09	-.08	-.13	-.14	-.14	VB/UINF
	.03	.06	.09	.09	.10	.09	.09	.09	.08	.05	.03	.02	WB/UINF
	-.04	.01	.03	-.01	-.06	-.05	.04	.05	.05	.04	-.00	-.02	CP
	.01	.01	-.09	[illegible]	-.32	-.26	-.13	-.07	-.03	.01	.02	.01	CPT
0.0	1.01	.98	.91	.92	.90	.88	.92	.94	.97	1.00	.99	1.01	UB/UINF
	.17	.16	.11	.07	.04	-.01	-.02	-.08	-.10	-.10	-.11	-.13	VB/UINF
	.02	.05	.07	.04	.10	.05	.06	.06	.06	.04	.05	.01	WB/UINF
	-.03	.03	.00	-.03	-.07	-.01	-.03	.02	.04	-.00	.01	-.04	CP
	.02	.01	-.14	-.18	-.25	-.24	-.18	-.08	-.01	.01	.02	.00	CPT
-.5	1.00	.98	.95	.90	.88	.90	.89	.93	.99	.97	1.00	1.01	UB/UINF
	.16	.15	.11	.03	.03	-.03	-.07	-.06	-.08	-.11	-.08	-.11	VB/UINF
	.00	.04	.01	.04	.03	.02	.04	.04	.03	.03	.03	.01	WB/UINF
	-.01	.03	-.02	-.04	-.07	-.04	-.03	.02	-.01	.04	.01	-.05	CP
	.01	.01	-.11	-.23	-.28	-.23	-.23	-.10	-.01	-.01	.02	-.00	CPT
-1.0	1.00	1.01	.89	.95	.89	.87	.94	.90	.96	.99	.97	1.01	UB/UINF
	.17	.13	.10	.06	.04	-.03	-.01	-.09	-.07	-.09	-.08	-.11	VB/UINF
	.00	.03	.01	.01	-.00	-.02	-.01	-.02	.00	.02	.02	.01	WB/UINF
	-.02	-.02	-.03	-.08	-.06	-.04	-.04	.02	-.02	.00	.02	-.03	CP
	.02	.02	-.22	-.17	-.26	-.27	-.15	-.16	-.09	-.01	-.03	.01	CPT
-1.5	1.02	.92	.77	.85	.77	.80	.80	.80	.85	.89	.93	1.00	UB/UINF
	.14	.14	.02	.02	.04	-.02	.01	-.01	.01	-.06	-.09	-.10	VB/UINF
	-.00	-.01	-.04	-.02	-.04	-.04	-.04	-.02	-.03	-.07	.00	-.01	WB/UINF
	-.04	-.01	.01	-.05	-.02	-.06	-.03	-.05	.00	.03	.00	-.03	CP
	.02	-.13	-.40	-.32	-.42	-.41	-.38	-.40	-.28	-.18	-.11	-.01	CPT

TABLE C4.- Continued

(b) R = 8. Continued.

X/D = 12.00 R = 8.02 UINF = 39.5 M/SEC
Z/D = 1.75 PHI = 0.0 DEG

ZB/D \ YB/D	-5.00	-2.52	-1.00	-.50	0.00	.50	1.00	1.51	2.01	2.51	3.01	3.51	4.02	4.52	5.02	6.02	
	.97	.95	.94	.90	.90	.91	.94	.93	.95	.96	.95	.94	.96	.99	.97	.98	UB/UINF
	.17	.13	.10	.06	.03	.02	-.04	-.05	-.05	-.07	-.09	-.10	-.08	-.11	-.10	-.08	VB/UINF
1.5	.02	.06	.08	.10	.07	.06	.09	.07	.07	.05	.05	.05	.03	.01	.01	-.00	WB/UINF
	.04	.09	.04	.04	-.01	-.06	.00	.05	.06	.06	.08	.09	.06	.01	.05	.03	CP
	.02	.02	-.06	-.13	-.20	-.22	-.10	-.08	-.03	.00	-.01	-.01	-.00	-.00	.01	.00	CPT
	1.00	.98	.95	.93	.90	.91	.88	.97	.97	.98	.99	.99	.99	1.01	1.01	1.02	UB/UINF
	.12	.10	.05	.07	.04	-.03	-.02	-.05	-.08	-.08	-.09	-.09	-.12	-.10	-.10	-.09	VB/UINF
1.0	.02	.07	.06	.05	.07	.06	.09	.07	.05	.08	.03	.04	.03	.02	.02	.01	WB/UINF
	.00	.03	.04	-.01	-.03	-.03	-.01	.00	.02	.02	.01	.00	-.00	-.03	-.03	-.05	CP
	.02	.02	-.05	-.13	-.21	-.20	-.23	-.05	-.03	-.00	.01	.00	-.00	.00	.01	.00	CPT
	1.01	.98	.94	.88	.94	.90	.91	.98	.97	.97	.98	1.00	1.00	1.01	1.00	1.01	UB/UINF
	.13	.11	.09	.05	.02	.04	-.03	-.04	-.07	-.06	-.08	-.09	-.09	-.10	-.11	-.10	VB/UINF
.5	.02	.05	.06	.06	.06	.06	.04	.05	.05	.05	.03	.04	.02	.02	.02	.02	WB/UINF
	-.01	.03	.03	.01	-.06	-.07	-.03	-.03	.01	.04	.03	-.01	-.00	-.03	-.03	-.04	CP
	.02	.00	-.07	-.20	-.18	-.25	-.20	-.06	-.03	-.00	.01	.01	.01	-.00	-.01	.00	CPT
	1.01	.98	.90	.91	.91	.91	.92	.92	1.01	.99	1.00	.99	1.00	1.00	.99	1.00	UB/UINF
	.14	.12	.08	.06	.02	.01	-.04	-.05	-.04	-.06	-.07	-.09	-.07	-.09	-.11	-.09	VB/UINF
0.0	.01	.04	.03	.05	.04	.00	.03	.04	.04	.04	.04	.03	.02	.02	.02	.04	WB/UINF
	-.03	.03	.05	.00	-.03	-.02	-.03	.00	-.05	.02	-.01	.02	.00	-.02	.01	-.33	CP
	.02	.01	-.14	-.17	-.19	-.18	-.18	-.15	-.03	.00	.01	.01	.00	-.00	.00	-.00	CPT
	1.01	.97	.92	.93	.94	.90	.90	.96	.96	.97	.97	.99	1.00	1.01	.99	1.00	UB/UINF
	.14	.12	.04	.05	.03	.02	-.02	-.02	-.08	-.06	-.07	-.08	-.08	-.07	-.09	-.10	VB/UINF
-.5	-.03	.02	.01	.02	.01	.01	.01	.01	.02	.03	.03	.02	-.02	.00	-.00	.02	WB/UINF
	-.02	.01	.01	-.00	-.03	-.02	-.04	-.02	-.02	.00	.03	.03	-.00	-.03	-.01	-.05	CP
	.02	-.02	-.14	-.13	-.15	-.20	-.23	-.09	-.09	-.06	-.02	.02	.00	-.01	-.02	-.05	CPT
	1.03	.96	.90	.86	.92	.88	.95	.99	.94	.98	.99	1.00	.99	.93	.97	.91	UB/UINF
	.12	.09	.05	.03	.04	.00	-.00	-.01	-.03	-.04	-.04	-.05	-.05	-.05	-.08	-.09	VB/UINF
-1.0	-.09	.03	.00	.00	.01	-.01	-.02	.00	-.02	-.00	.01	.02	.01	-.02	-.02	.04	WB/UINF
	-.07	-.00	.01	.03	-.07	-.04	-.04	-.06	-.02	-.01	-.03	-.01	-.01	.00	-.09	-.05	CP
	.01	-.06	-.18	-.23	-.22	-.26	-.14	-.07	-.13	-.04	-.04	-.00	-.02	-.12	-.13	-.21	CPT
	1.01	.88	.84	.82	.83	.71	.81	.82	.79	.85	.86	.95	.94	.95	.92	.77	UB/UINF
	-.01	.02	.01	.02	.03	-.01	.02	-.01	.00	.01	-.01	.01	-.03	-.00	.02	-.01	VB/UINF
-1.5	-.05	-.01	-.02	-.02	-.03	-.03	-.03	-.03	-.03	-.03	-.01	-.02	-.02	-.02	-.04	.02	WB/UINF
	-.03	-.01	-.00	-.01	-.03	.02	-.03	.00	.02	-.00	.01	-.04	-.01	-.01	-.05	-.04	CP
	.00	-.23	-.30	-.33	-.33	-.47	-.38	-.31	-.36	-.28	-.24	-.14	-.12	-.12	-.19	-.45	CPT

TABLE C4.- Concluded

(b) R = 8. Concluded.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TP-1087		

4. Title and Subtitle	5. Report Date
INDUCED VELOCITY FIELD OF A JET IN A CROSSFLOW	May 1978
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
Richard L. Fearn and Robert P. Weston	L-11624
9. Performing Organization Name and Address	10. Work Unit No.
NASA Langley Research Center Hampton, VA 23665	505-11-24-02
	11. Contract or Grant No.
12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
National Aeronautics and Space Administration Washington, DC 20546	Technical Paper
	14. Sponsoring Agency Code

15. Supplementary Notes

Richard L. Fearn: University of Florida, Gainesville, Florida.
Robert P. Weston: Langley Research Center, Hampton, Virginia.
Appendix A by Thomas A. Trovillion, Jr., University of Florida, Gainesville, Florida.

16. Abstract

An experimental investigation of a subsonic round jet exhausting perpendicularly from a flat plate into a subsonic crosswind of the same temperature has been conducted in the Langley V/STOL tunnel. Velocity and pressure measurements were made in planes perpendicular to the path of the jet for ratios of jet velocity to crossflow velocity ranging from 3 to 10. The results of these measurements are presented in tabular and graphical forms. A pair of diffuse contrarotating vortices is identified as a significant feature of the flow, and the characteristics of the vortices are discussed.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Jet in a crossflow Velocity field Subsonic crossflow Jet plume	Unclassified - Unlimited Subject Category 34

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	146	$7.25

* For sale by the National Technical Information Service, Springfield, Virginia 22161